100 Hot Emerging Companies

Our special supplement follows page 58.

IS/veterinarian team shows it doesn't take a computer science degree to build an extranet. The Internet, page 49

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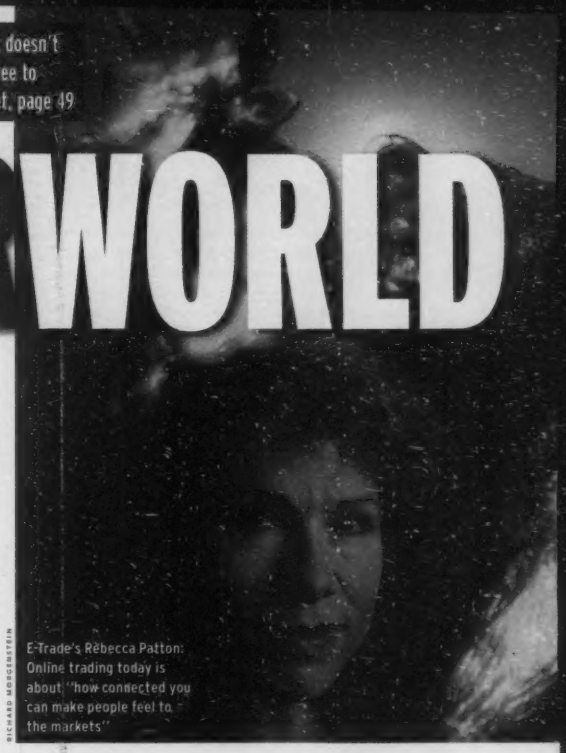


RICHARD MORGENSTEIN

E-Trade's Rebecca Patton: Online trading today is about "how connected you can make people feel to the markets"

Cross-platform = Microsoft?

▸ *Java threat forces revamp of development tools*

By Sharon Gaudin

MICROSOFT CORP. is combining Dynamic HTML with its family of application development tools in a bid to counter Java's cross-platform threat.

The Redmond, Wash.-based software giant is adding Dynamic HTML components to its set of development tools — ranging from Visual C++ to Visual Basic and Visual J++ — to enable them to create applications that can be accessed from any platform. The souped-up tools are slated for completion by the middle of next year and will be phased in over time.

HTML is the standard language used to write World Wide Web pages. Dynamic HTML enables developers to build interactive Web pages.

"This is very encouraging news. In the past, when Microsoft talked about cross-platform,

Microsoft, page 14

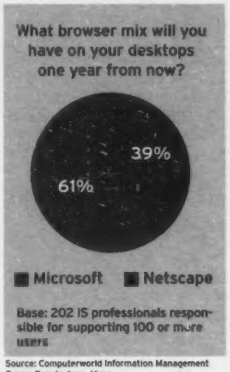
Explorer to slip past Navigator

By Carol Sliwa

THE BROWSER WARS will ratchet up tomorrow when Microsoft Corp. ships Internet Explorer 4.0, which company brass predicts will propel its market share past rival Netscape Communications Corp.

According to an exclusive Computerworld Information Management Group survey, Mi-

CW survey, page 2


What browser mix will you have on your desktops one year from now?
39%
61%
Microsoft
Netscape
Base: 202 IS professionals responsible for supporting 100 or more users
Source: Computerworld Information Management Group, Framingham, Mass.

IT recruiting options multiply

By Julia King
Los Altos, Calif.

ARMED WITH an ever-present flip-phone, digital pager, seven E-mail addresses and several fax machines, high-tech recruiter and consultant Emily Nelson is rarely, if ever, out of touch.

Even a few minutes off-line could cost her a valuable contact or delay closing a deal, which in the high-stakes world of Silicon Valley recruiting can translate into thousands of dollars in lost cash and stock options.

Nelson, 26, is a principal at TalentWave, a high-tech executive search firm here. In the past

IT recruiting, page 110

Self-mutating Word viruses create strain

By Sharon Machlis

COMPUTER VIRUSES aren't always written by people.

In fact, many new virus strains that could damage user documents aren't the handiwork of malicious hackers but the result of a glitch in Microsoft Word, many industry observers say.

And that means more ways for destructive code to get into Word documents potentially undetected. That's because most

Word viruses, page 16

'NET PROFITS

▸ *Online brokerages solve E-commerce equation*

By Stewart Deck and Tim Ouellette

ON A TYPICAL day last week, 95,000 stock trades were made using the Internet.

The online brokerages were happy because they made close to $2 million in commissions. The investors were thrilled because they saved at least $7 million by buying online instead of paying the higher commissions of traditional brokers.

That, in a nutshell, explains why online stock trading has become one of the few Internet businesses making profits. Online trading is "one of the standout success stories" of electronic commerce, said Bill Burnham, an analyst at Piper Jaffray, Inc. in Minneapolis.

Fast-growing E-Trade Group, Inc. in Palo Alto, Calif., for example, saw its most recent quarterly revenue skyrocket 138% over the same quarter last year to $37 million. For the full fiscal year, analysts expect the company's revenue to reach $126.4 million and yield a profit of $11.8 million.

Overall, a recent survey by Forrester Research, Inc. found that 30% of online stockbrokerages are profitable and that another 20% are breaking even.

Of course, it helps that the business is riding a bullish stock market and is tailor-made for electronic commerce. But pioneers said there are lessons

Brokerages, page 28

Master of the domain. The Internet gains 3,000 domain names **every day.** **Nearly all** end in .com. A new naming scheme is needed **pronto.** As **Network Solutions, Inc.'s** exclusive registration contract winds down, an international **free-for-all** rages among groups that lust after the power to assign addresses.

In Depth, page 85

PAMELA HOBBS

NEWSPAPER

UP FRONT

Federal folly

Apparently flush with victory from its dramatic success at limiting Microsoft's competitiveness, the federal government has turned its guns on Intel. The Department of Justice and the Federal Trade Commission — the Tweedledum and Tweedledumber of antitrust prosecution — have begun investigating Intel for possible anticompetitive practices (see story, page 3).

The government's message to the computer industry should be clear: Technology vision, strategic foresight and flawless execution of a business plan aren't qualities that will go unpunished.

The driving force behind the investigation appears to be a group of companies whose bone of contention is that they are not Intel. Well, a lot of us are put out by that fact, but that's no reason to haul a company into court.

Correct me if I'm wrong, but I always thought the litmus test of antitrust regulation was whether consumers were being harmed. If that's the case, then the government's investigation comes at a strange time.

The government's investigation comes at a strange time.

Computer Intelligence reported last week that the remarkable drop in PC prices is hitting home with buyers. Sales of PCs less than $1,000 made up 23% of all PC sales in July, more than triple the figure just six months previous. And MicroElectronics, Inc. in Columbus, Ohio, began selling a full-featured Intel-compatible PC for $499.

Someone stop this madness before consumers get hurt!

As recently as 1990 a lot of very smart people were questioning whether the U.S. could maintain its computing dominance in the face of an onslaught of competition from Asia. Thanks to the innovation of companies such as Intel, the main question facing the U.S. computer industry today is, How high is up?

Maybe instead of throwing the book at Intel, the government should consider giving it a medal.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE

BY RICH TENNANT

E-mail Rich Tennant at theswave@tiac.net

CW survey: Explorer gains ground

CONTINUED FROM PAGE 1

crosoft has already caught up to Netscape and will be solidly ahead in a year. The survey has been tracking the browser buying habits of 202 information systems professionals.

The survey showed that Netscape's 71%-to-29% lead of six months ago has been wiped out. Now, surveyed sites are evenly split as to their primary browser supplier. And 61% said they expected Internet Explorer to be their primary browser in six months, compared with 39% for Navigator.

Users cited three main reasons for moving to Internet Explorer: It is free, it is bundled with other Microsoft products, and it is the logical choice for companies that standardize on Microsoft.

"[Internet Explorer] is free. It's just one less license to have to worry about renewing and paying for," said James McNaboe, a computer scientist at PerMedics, Inc., a health care IS company in Loma Linda, Calif. He switched to Internet Explorer four months ago.

"Basically, we're a Windows environment. We use Microsoft Proxy Server, and we try to keep everything as uniform as possible," said Dion Hargreaves, network manager at Central National Bank in Junction City, Kan.

Bruce Renninger, IS product leader at Lancaster Health Alliance, Inc. in Lancaster, Pa., said, "There are two factors. The first is cost, and the second is that we have standardized with Microsoft products."

KEY DIFFERENCES

Very few of the users surveyed said Explorer's features were a determining factor in their purchasing decision. But there are some key differences between the rivals' latest offerings.

"Netscape has a discrete browser with some groupware componentry, and Microsoft has a browser that is nearly completely integrated into its desktop operating system," said Harry Fenik, an analyst at Zona Research, Inc. in Redwood City, Calif.

The major points of distinction include the following:

- Microsoft's Active Desktop, which lets users update and display World Wide Web content anywhere on their desktop through windows of variable size. Netscape delivers information through channels in its separate Netcaster component.
- Internet Explorer's shell integration feature, which lets users browse their hard drives the same way they surf the Web.
- Data binding, which can automatically update Hypertext Markup Language (HTML) pages when back-end data changes.

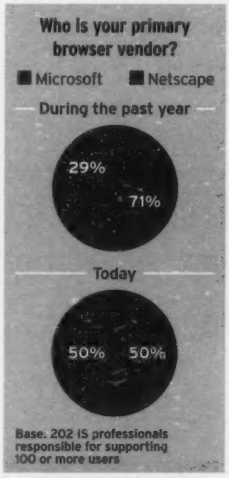
The feature that has developers such as Richard Brant particularly excited is Microsoft's version of dynamic HTML. Brant is a Middletown, Conn.-based systems engineer at a division of Aetna, Inc.

Through dynamic HTML, a block of data can be downloaded from a Web server and cached on the local machine, with only the data subset that is needed displayed. When another piece of data is needed, it can be drawn from the cache rather than the server.

Internet Explorer 4.0 also will include controls that will enable users to view data without a continuous connection, according to Paul Gross, vice president of development tools at Microsoft. With existing technologies, a user disconnected from a network can't view the data brought down in an application. With the new controls, the user could download the information, terminate the connection and locally manipulate the data offline. □

NEW FEATURES IN INTERNET EXPLORER

Feature	Function
Active Desktop	Lets users update and display Web content anywhere on their desktops through various-size windows
Shell integration	Provides consistent navigation through the hard drive and the Web
Explorer bars	Splits the screen into two panes, displaying search results or favorite Web sites on one side and page previews on the other
Security zones	Gives users the ability to screen out unwanted applets or controls



Source: Computerworld Information Management Group, Framingham, Mass.

Take a look at how 25 best-of-breed organizations around the globe are excelling in network technology
The Network 25
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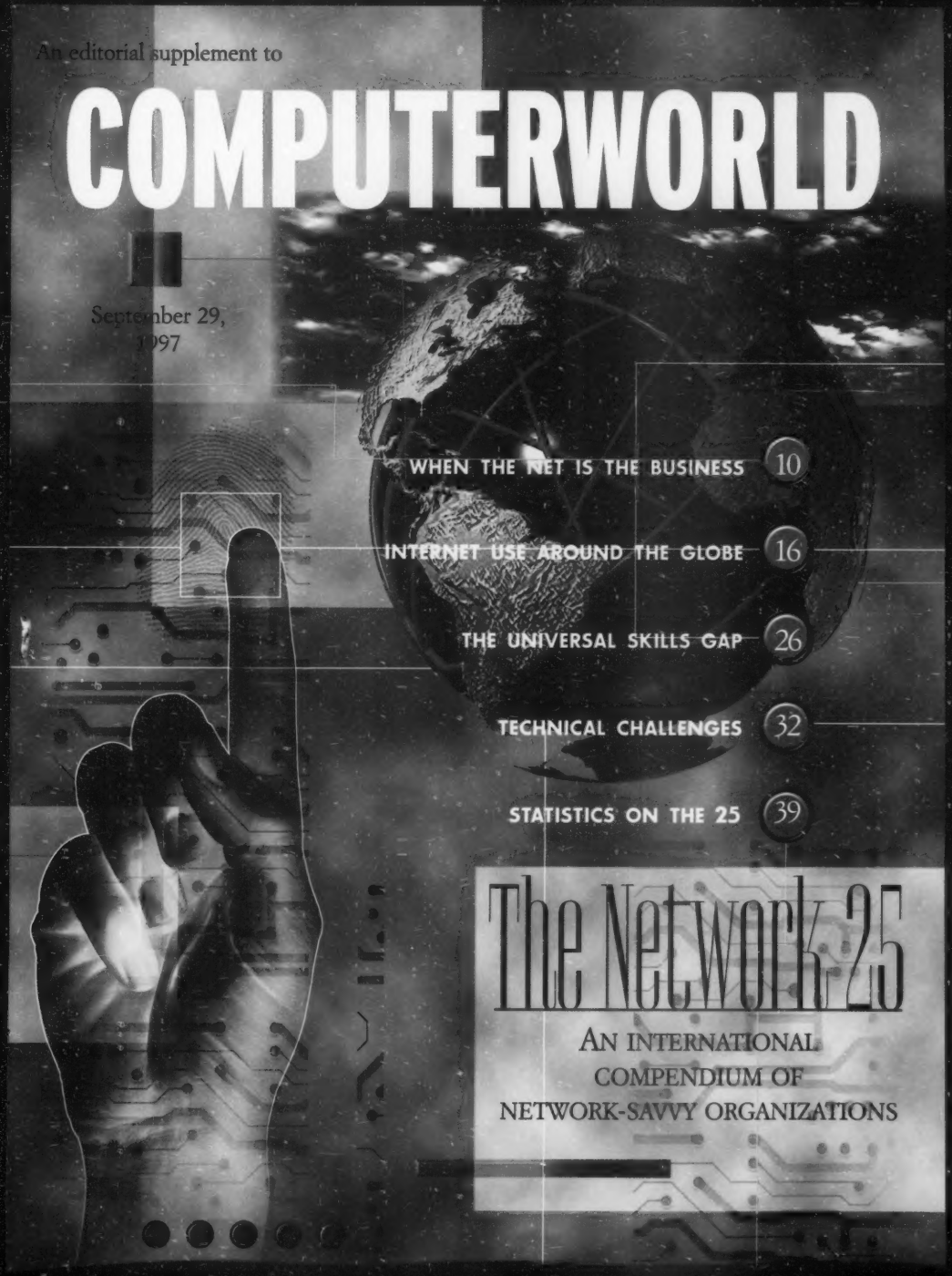
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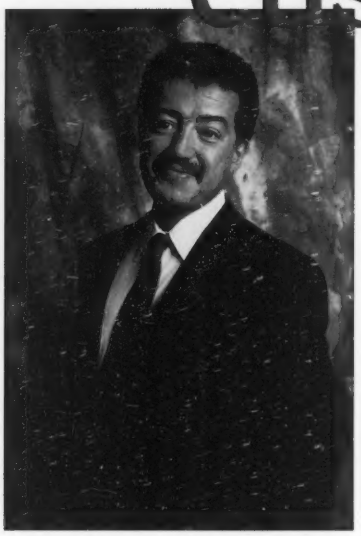
The Network 25
AN INTERNATIONAL COMPENDIUM OF NETWORK-SAVVY ORGANIZATIONS

Leadership[3]

Satisfying the world's toughest customers



3Com is proud to sponsor the 1997 Network 25 magazine. This Computerworld publication profiles organizations building the kind of network infrastructure necessary for business success in the 21st century. The rapidly escalating use of Internet and related technology brings a new imperative to network architects. The companies Computerworld has named to this list are some of the best and the brightest in IT leadership around the world. Their profiles provide valuable peer reference as you move toward your own goals.

In the following pages you'll learn how 25 leading organizations across the globe are adopting — and adapting — the Internet and intranets into the vital operations of their business.

While this marks the second year of 3Com sponsorship, in many ways 3Com is a brand new company. Our now-completed merger with U.S. Robotics created a $7 billion global presence, uniquely offering strengths from the edge to the heart of the network. No other company offers this breadth of product and depth of networking knowledge.

This merger allowed us to exercise our own commitment to networking's fundamental role within our business. Like any other firm profiled within these pages, 3Com had to meet our own set of challenges — from the smooth, virtually overnight e-mail consolidation of 13,000 employees, to the worldwide sharing of business information via a common intranet.

Our performance also had to meet the expectations of some of the world's most sophisticated network experts — our employees. Perhaps you'll see us in next year's Network 25 as a success story too.

I sincerely hope the examples within this supplement help you understand and solve your own network challenges — and that you look to 3Com as a willing partner in those efforts.

Eric Benhamou
President and Chairman of the Board, 3Com Corporation

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The Network 25

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"We've had nothing but great experience with 3Com equipment, so choosing them as a partner was easy."

—John Palmieri
Senior Network Administrator, PointCast Inc.

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Wide Area Networks[3]

PointCast needed to create a secure WAN as big as a continent. So they turned to someone they trusted.

Wide Areas & Absolute Control

John Palmieri of PointCast Incorporated knows networks. Which is why he built his from scratch with 3Com products. Making network access secure for all his branch sites, while maintaining 7x24 service for more bandwidth-hungry applications is vital to expanding PointCast's business. He can do all of this with 3Com solutions. Best of all, he has built on an already great relationship.

"3Com service and support has always been there for me; they actually check in to make sure everything is okay. And everything always is."

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The Network 25

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COVER ILLUSTRATION Roy Wiemann

From the editor

TURNING NETWORK NODES INTO MOTHER LODES

NETWORKS ARE THE LIFEBLOOD OF CUTTING-EDGE ORGANIZATIONS. BUSINESSES WOULD GRIND TO A HALT WITHOUT VITAL KERNELS OF INFORMATION PULSATING THROUGH TWISTED PAIRS OF COPPER AND FIBER-OPTIC WIRES. ONE LOOK AT SUCCESSFUL COMPANIES THROUGHOUT THE PACIFIC RIM, EUROPE, THE AMERICAS AND THE ISLAND CONTINENT OF AUSTRALIA MAKES THAT CLEAR.

AROUND THE GLOBE, WORKGROUP LANS HAVE GROWN INTO DEPARTMENTAL NETWORKS. MANY HAVE BEEN SPLICED INTO ENTERPRISE WANS SPANNING CAMPUSES, COUNTRIES, EVEN THE GLOBE. SHARED-FILE AND COMPUTING SERVICES HAVE TRANS-MOGRIFIED INTO COLLABORATIVE APPLI-CATIONS THROUGH WHICH E-MAIL, WORK SCHEDULES, SPREADSHEETS, WORD PROCESSING DOCUMENTS, VOICE, VIDEO AND IMAGES ARE PASSED AROUND AS EASILY AS GOSSIP BETWEEN CO-WORKERS.

OR AT LEAST IT SEEMS THAT WAY, WHEN NETWORKS WORK.

NETWORKING IS NOT EASY, WHETHER IT IS ACROSS THE HALL OR THE GLOBE. DESPITE EVOLVING STANDARDS AND GLOBAL TELECOM DEREGULATION, THERE ARE PLENTY OF ISSUES STILL PLAGUING ORGANIZATIONS AND THEIR NETWORKS AROUND MANY REGIONS OF THE WORLD: PROHIBITIVE COSTS, LIMITED BANDWIDTH, UNSTABLE AND LIMITED ACCESS AND A DEARTH OF SKILLS. THE ONLY CONSTANT IS THE NEVER-ENDING BATTLE TO OVERCOME THESE OBSTACLES AND TRANSFORM NETWORK NODES INTO MOTHER LODES OF KNOWLEDGE.

OUR NETWORK 25 EXPLORES HOW BEST-OF-BREED ORGANIZATIONS ACROSS THE GLOBE ARE DEALING WITH THESE CHALLENGES AND MORE. LOOK INSIDE AND SEE HOW SMALL THE WORLD REALLY IS.

Alan Alper

INTERNET: ALAN_ALPER@CW.COM

EXECUTIVE SUMMARY

25 NETS *that work*

by ANNE MCCRORY

THIS YEAR'S NETWORK 25 PRESENTS BEST-OF-BREED NETWORKERS AMID TODAY'S TECHNOLOGY CHALLENGES. HOW DO YOU COMPARE?

WHAT IS THE NETWORK 25, ANYWAY? By now, you know it's our second annual "international compendium of network-savvy organizations."

By the time you read our issue, you'll know it's a list of 25 companies and other types of organizations with vision. With priorities. With technology strategies to empower widely dispersed employees the most cost-efficient, forward-looking way possible.

And you'll know something about the challenges they face across the varied terrain of our planet — not to mention the hodgepodge of technologies that make up and operate on their networks. You'll also find out how the Internet is — or isn't — changing business frontiers in various parts of the world, what skills are lacking and where, and what the experts foretell for the years to come.

As for The Network 25 organizations, they are a varied lot, as are the regions they represent: U.S. and Canada, Latin America, Europe, Asia and Australia, New Zealand and Southern Africa.

Their median 1996 information systems spending is $100 million. The range: from $3 million (the Stockholm Health Care Authority) to $3.75 billion (Samsung Electronics Co.).

The median networking budget? A sound $25 million. Amounts ranged from $1.3 million (Argentine Beverages Division) to $1.3 billion (Samsung). That was anywhere from 12% to 66% of the IS total.

What did they spend it on? We asked for a breakdown, and the group was fairly unified. More organizations — three in four — reported LANs among their top two priorities than any other technology. More than half named WANs. About a fifth noted network management, Internet/intranet and switching. All this is part of making the network the strategic asset it must be to move business to the 21st century (see ➤

The Network 25

AN INTERNATIONAL COMPENDIUM OF NETWORK-SAVVY ORGANIZATIONS

ARGENTINE BEVERAGES DIVISION, ARGENTINA

ARGONNE NATIONAL LABORATORY, U.S.

ATRAXIS AG, SWITZERLAND

BANCO BRADESCO SA, BRAZIL

BENETTON SPA, ITALY

BRITISH PETROLEUM, U.K.

CASINO WINDSOR,CANADA

CEMEX SA DE CV, MEXICO

COMPANHIA VALE DO RIO DOCE, BRAZIL

CSX CORP., U.S.

THE EQUITABLE COMPANIES, INC., U.S.

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HONGKONG AND SHANGHAI BANKING CORP., U.K.

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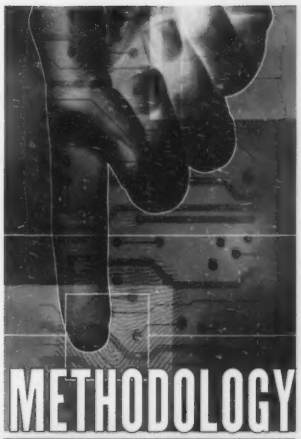

METHODOLOGY

COMPUTERWORLD EDITORS selected The Network 25 from a pool of more than 125 organizations identified as network-savvy by our editors and researchers in the U.S. and at international IDG affiliates.

All organizations were surveyed on IS and networking expenditures, types of projects and priorities, staff and Internet-related issues.

Our selection criteria ruled out any organization spending less than 10% of its information technology budget on networking. We further examined how networking spending is aligned with strategic and tactical endeavors and is used to meet regional business challenges.

Finally, we sought a global distribution of candidates so that no more than 25% were from the U.S. and Canada and the remainder were as equitably dispersed as possible among Europe, Asia, Latin America and Australia, New Zealand and Southern Africa.

This list is not a ranking or a definitive list of the best networked companies in the world; rather it is a representative sampling of companies in various regions that are using network technologies to meet business objectives.

the "Net equals business" section, beginning on page 10).

Where the Web is concerned, all but two of The Network *25* have a Web site. In a tribute to their technical and business prowess, a somewhat astonishing 64% report that they are selling products on their site, and an even higher number — 68% — are using it to collaborate with business partners. Their comments regarding how the Internet provides business value were equally telling: facilitates information sharing and collaboration across geographic boundaries. Serves as data processing system infrastructure. Provides fast connection to all via email. Allows for extended service hours. Attracts younger and/or more customers.

Yet the Internet, global playing field that it is, has not made all these organizations international ones. More than half use it to communicate only with customers or businesses inside their own country; 40% use it to communicate with parties elsewhere; and only 8% report using it on both domestic and global fronts.

Why? As our Internet package (page 16) explains, one site doesn't fit all. Language and cultural barriers often stymie efforts intended to appeal to a broad populace. And the expense of connections, small local populations, low computer literacy and slight per-capita income still limit use across much of the globe, even as use overall creeps upward.

'NET IMPACT

Despite these considerations, the Internet has made an indelible impact on all The Network *25* organizations. All report some kind of system or network upgrades to handle the resulting internal traffic increase. Seven in 10 have upgraded bridges, routers and hubs. Two in three have upgraded servers. Half have migrated their entire network to TCP/IP. One in three has embraced Fast Ethernet and ATM in the backbone or undergone some other kind of upgrade.

Where access is concerned, half use their own hub or Web server; one in four uses a service provider exclusively; and one in four uses some combination of the two. Eighty percent termed high-speed access "expensive but worth it"; the others called it "affordable." Half use a combination of dial-up lines, ISDN, T1 and other means; one in four uses some other type of connection; one in 10 uses ISDN exclusively.

But the Internet is hardly their only concern. More longstanding networking technologies and applications, from WANs to E-mail, pose challenges worldwide (see "One Network Doesn't Fit All," page 32). And specific projects run the gamut. British Petroleum is upgrading 32,000 PCs in 100 countries to a common platform, ensuring intranet and Web access for all and developing "virtual teams" that communicate by videoconferencing. Qantas Airways is upgrading a network to incorporate an acquisition and develop a strategy. See these and other stories in our Profiles section, which starts on page 39.

The Network *25* is also about people: the median 45 networking professionals employed by the organizations on our list and the skills their organizations are desperately seeking. (These include networking and/or security skills at more than half the firms; system architects, network managers, router/switch specialists at many of the others.) A closer look at individual markets begins on page 26.

Finally, our regional analysis by experts starts on page 50. And don't miss the details on the Network *25* in the tables starting on page 54. As these organizations spend their technology dollars and work to embrace the Internet, so they, like us, strive to make sense of our ever-evolving networked world.

McCrory is managing editor of the Network 25.

Solutions[3]

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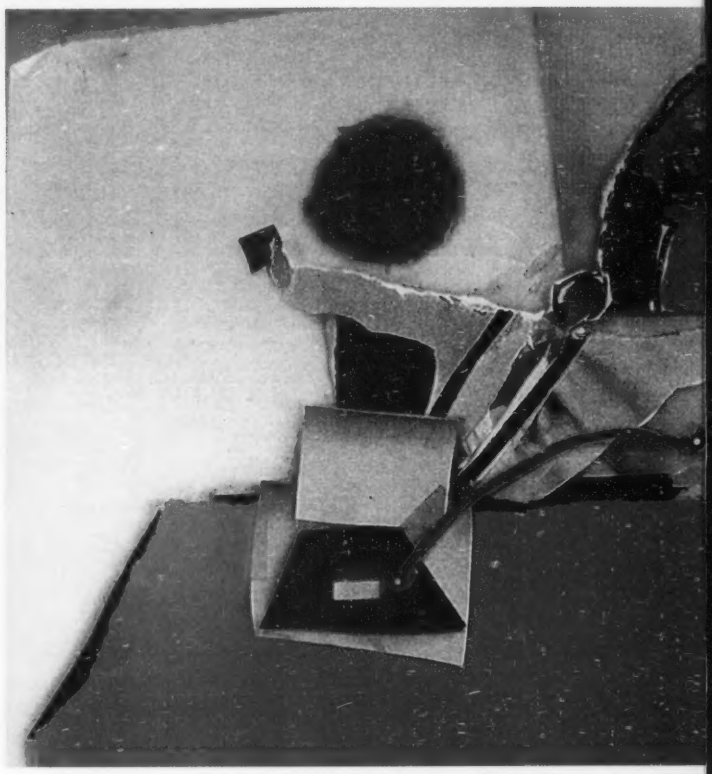


NETWORKS TODAY ARE AS CRITICAL AS SYSTEMS IN ACHIEVING BUSINESS GOALS. YET SOME COMPANIES ARE JUST BEGINNING TO FIGURE THAT OUT.

Net *equals* BUSINESS

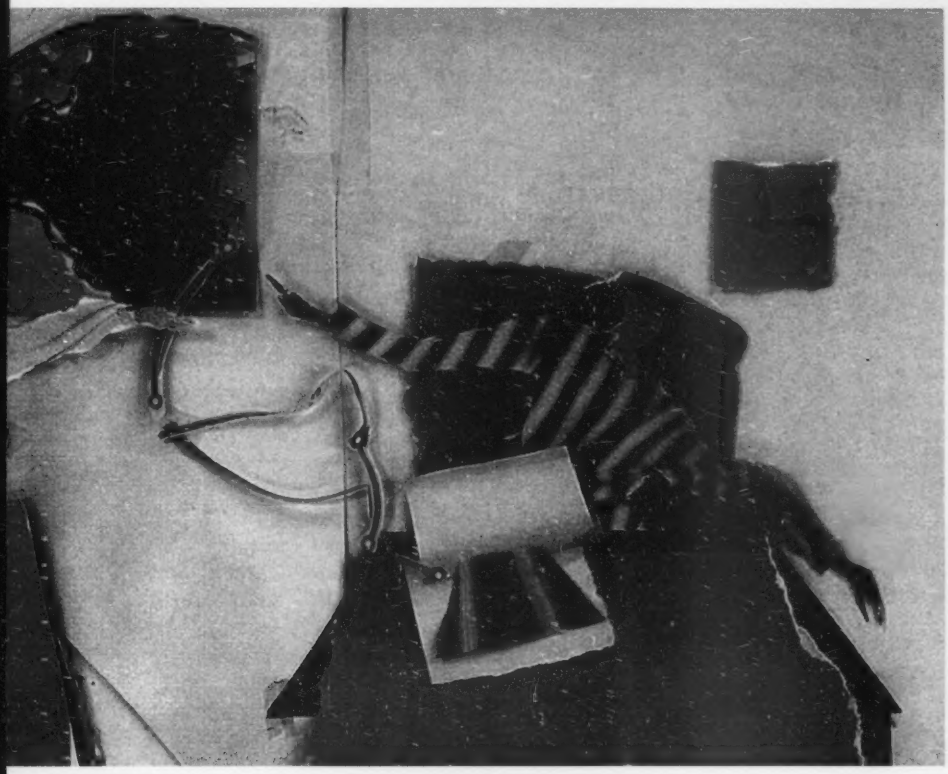


illustration by ALEX HACKWORTH

by MICHAEL DORTCH

After spending gobs of time and money straining to build enterprise networks, many organizations across the globe are still struggling to get their digital conduits in sync with ever-shifting business goals.

Clearly, distributed computing — where the network is as critical as the systems — is very much alive and well. It continues to thrive in traditional fat-client deployments and is taking hold in thin-client and intranet and extranet environments as well.

But users still have some distance to go in understanding all of the technical, cultural and organizational factors required to get enterprise networks to fully support their businesses. Doing so means knowing how to work in regions where infrastructure is poor, using private networks if necessary. It means knowing your priorities and, in the process, perhaps delaying some deployments until the technology matures or its adoption becomes widespread. It means knowing how to forge alliances not just outside your company, but also within it.

Conflict continues on all fronts. Take one CIO from a worldwide construction concern who says he's trying to get strategic "buy-in" from his CEO, a senior executive who is "just emerging from the Stone Age" when it comes to strategic networking. Then ➤

there's the IS manager at a major provider of insurance and financial services whose concern isn't the technology, but the use of it. "[At our company,] we have an intranet that's really exploding. Everyone and their uncle wants to put stuff on it," says this manager, who like others spoke only on the condition he not be identified. "But I'm not sure how they're tying it to our business objectives."

An IS manager at a company in the aerospace industry takes that to another level. "There's a lack of awareness of the products in the marketplace and their capabilities" among senior corporate executives, he says, which results in many IS managers implementing solutions because "they're cool, not because they're good business." That, he says, underscores a lack of vision.

But there are plenty of organizations that do have leadership and do espouse a technology vision.

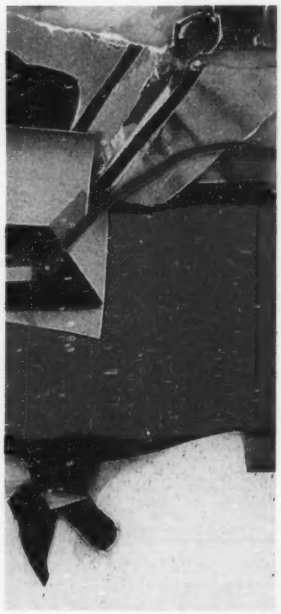
SOME LEADERS

The Hongkong and Shanghai Banking Corp. concluded in the early 1980s that without a global network tethered tightly to core business objectives, it would be unable to grow into a global bank from the six countries it then served. And that network (which became an X.25 packet-switched backbone and is now embracing frame relay) not only needed to serve clients, but also had to provide bank employees with information resources required to meet global banking imperatives.

"Once we have a beachhead somewhere, customers have to have access to everything we have — every system," notes Tim Cureton, the bank's head of group telecommunications. And from their desks, employees must be able to access any server — provided, of course, they have permission — wherever it is, he adds. This isn't just a desire, it's a mandate at the bank, whose network connects 3,000 offices in 72 countries and handles voice, SNA data and LAN traffic generated daily by its millions of global accounts. "You must use a group system for the same purpose, whether it is in Equator Bank in Africa, whether it is Marine Midland Bank in the States or Midland Bank in the U.K.," Cureton explains, citing various subsidiaries. (See related story, page 47.)

Employees at Hongkong and Shanghai Banking Corp. must be able to access any server, no matter where it is. The evolving frame-relay network connects 3,000 offices in 72 countries and handles voice, SNA data and LAN traffic from millions of global accounts.

DHL Worldwide Express is also



wielding networking clout to achieve competitive business advantage. In a never-ending battle of technological one-upmanship with Federal Express Corp. and United Parcel Service, Inc., the package delivery company is reportedly looking to drive its DHLNET global network (a TCP/IP over X.25 and frame-relay backbone) to new heights, according to one company source. DHL wants to allow customers in 217 countries to initiate and track shipments to and from anywhere in the world via its World Wide Web site, even if elements of those shipments are handled by other carriers.

For example, a traveling DHL customer could track or reroute shipments initiated from his office before his trip began and even initiate new shipments designated to reach him at future locations on his itinerary. This new service will be targeted at occasional and low-volume shippers and is designed to complement DHL's existing services for high-volume users, the company source says. DHL did not return calls by press time.

The service is being built with C++ tools from Rational Software Corp. and will use Informix databases as back-end resources. To avoid the management overhead and expense of buying or building networking facilities in every country it serves, DHL plans to rely on leased Internet lines and Internet service providers (ISP). The company is also negotiating guaranteed levels of service with carriers and ISPs around the world, the source says.

NOT JUST THE NETWORK

Even at companies where networks are treated strategically, however, potential pitfalls abound. Perhaps surprisingly, observers say the complexity of distributed applications can be more of a problem than networking infrastructure. That may not be entirely obvious to all users.

"Many companies started [building] client/server applications and found out that it took longer than they thought and, many times, [went] way over their budget," says Hong Chen, president and CEO of AimQuest Corp., a Milpitas,

Calif., developer of a worldwide network of ISPs and telecommunications services. The fate of distributed computing has more to do with the difficulty of deploying client/server applications than with network bandwidth or infrastructure improvements, Chen notes.

Carrier and ISP improvements in networking bandwidth and infrastructure don't mean much to users who are grappling with this side of the coin. But, as some organizations begin to shift to TCP/IP-based networks and intranets or thin clients for their computing platform, some of these headaches begin to go away. Applications no longer need to be rewritten to accommodate every piece of communications software between the client and the server, so some applications are faster, easier and less expensive to build and deploy.

Of course, with new technologies also come new problems, from management of Java applets and ActiveX controls to finding ways to address and overcome the same bandwidth issues facing carriers and ISPs.

At British Petroleum, for instance, more multimedia applications in use by widely dispersed employees is raising the bandwidth flag. The challenge: When employees in more than 100 countries can run video clips over the intranet, the source and destination of the bandwidth needed is unpredictable.

"Because every workstation has access to BP's global intranet, you don't know who will be accessing what from where," explains Andy Haywood telecom-munications team leader. "We don't want to provide bandwidth just in case there is demand, nor do we want to provide it just too late." Some solutions: frame relay with scalable bandwidth, plus bandwidth top-up with ISDN, and use of network management to be more proactive in monitoring trends and assessing when new bandwidth will be required.

BEYOND THE INTERNET

Networking continues to contain numerous non-Internet challenges too, of course. Global enterprise networkers must be acutely aware of, and concerned about, the uneven state of networking infrastructure around the world. The only weapons they have are contracts with enforceable clauses guaranteeing minimum service levels and as many back-up facilities as they can afford, especially where local infrastructure is weakest.

Some enterprises depend more on private facilities and rely primarily on carrier services only where these have proved reliable.

And sometimes a company hands the job over to a third party to concentrate more on other initiatives. "We have eliminated our own private network for voice and data — except in some place such as Southeast Asia where we don't have the opportunity to use serviced networks," says BP's Haywood. "We want to simplify and rationalize the way we do things across the globe, and to do it in a common way." (See related story, page 40.)

Users have some distance to go in understanding all of the technical, cultural and organizational factors required to get enterprise networks to fully support their businesses.

The bottom line for global networks: Some assembly is still required — and certainly will be for some time to come.

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Solutions[3]

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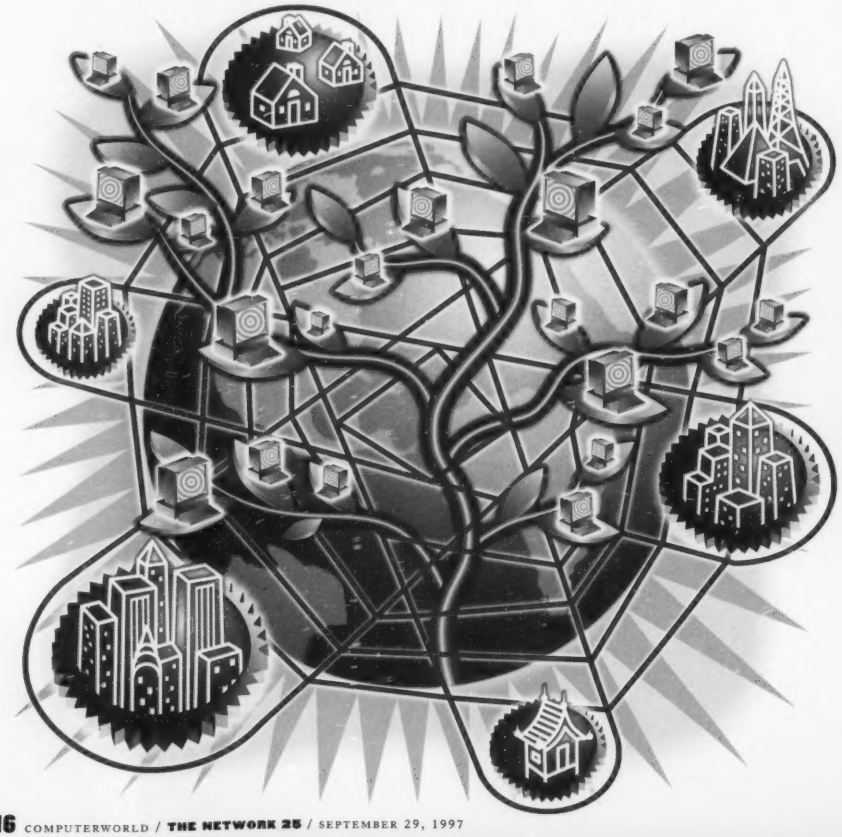
Global WARMING *to the net*

REGIONS ARE LOGGING ON TO THE WEB AS LOCAL CONDITIONS PERMIT



by ELISABETH HORWITT

NO QUESTION ABOUT IT: The World Wide Web is becoming a truly worldwide business communications medium. One has only to look at the numbers to see it.

In Brazil, the number of Web sites has exploded from 800 in January 1995 to 77,148 in January 1997, according to Cais Internet, a McLean, Va.-based Internet access provider.

In the U.K., 175 companies out of 500 surveyed by The TDS Group Ltd. in High Wycombe, Buckinghamshire, England, said they own Web sites.

In Malaysia, Internet users have more than quadrupled to more than 250,000 during the past two years, according to Nikkei BP Biztech, a Santa Clara, Calif., research and Web-based provider of information on Asian technology and business.

And in the U.S. and Canada, which will continue to be the epicenter of Internet/Web use, the number of households online will continue to grow through the year 2000, according to Jupiter Communications, a research firm in New York. Jupiter predicts an increase from 15.4 million households online at year-end 1996 to 38.2 million by 2000.

These growth figures, however, are only part of an extremely diverse picture. While Web commerce burgeons in prosperous nations such as Japan or the U.S., Third World countries are still struggling to get a basic network infrastructure to support the Web. And while business-to-business Web commerce has, for the most part, gone global, cultural, language and currency barriers coupled with low PC penetration has prevented consumer Web commerce from taking off in all but the top-tier countries.

Furthermore, although business Web sites are indeed proliferating in the world's economically developed countries, a large portion of those sites are extremely basic.

In the U.K., for example, the 175 company Web sites reported in TDS's survey "were mostly a statement of what a company does: a brochure, not a catalog," says Adrian Gregory, chief executive of TDS, which is in the process of setting up a Web-based trading environment.

In Brazil, too, companies use such pages principally to "get the company's name out" on the Web and, therefore, out to the world market, says Paul Shanahan, manager of user support for the American Chamber of Commerce, a Brazilian nonprofit business support organization. "Web commerce is just starting in Brazil."

Businesses all around the world are getting on the Web because they "don't want to be the only one that's not doing it," says Carlos Perry, ➤

illustration by JOHN BLECK

LATIN AMERICA

It might be only 3% online today, but fasten your seat belt

When it comes to World Wide Web use, "Latin America is a baby, but a baby with a thyroid condition," says Fernando Espuelas, chief executive officer of Starmedia Network, Inc. "There's an explosion today in Latin America of Internet use at all levels: consumer, business, government."

Espuelas should know: His company in Riverside, Conn., is counting on that explosion to power the market for its growing family of Web-based services, ranging from E-mail to financial information to Web hosting services.

Right now, the market for such services is minuscule, Espuelas admits. Only about 2 million PCs and between 3 million and 6 million users are currently connected to the Internet. That's 3.3% to 6.6% of a total Latin American population of 90 million, compared with about 40% PC penetration in the general U.S. population, Espuelas says.

Only about 2 million PCs and between 3 million and 6 million users are now connected to the 'net. That's 3.3% to 6.6% of a total Latin American population of 90 million, compared with about 40% PC penetration in the general U.S. population.

FERNANDO ESPUELAS, *CEO of Starmedia Network, Inc.*

Indeed, much of Latin America remains a hostile climate for fostering Web commerce. Real per-capita income in 1996 ranged from $1,022 in Ecuador to $5,632 in Argentina, according to The Yankee Group, a research firm based in Boston. The telecommunications infrastructure is still primitive, particularly in the interior

Continued on page 19 ➤

a program manager at The Yankee Group in Boston. Once they have planted a flag in the Web turf, many businesses need further motivation — a profit motive or competitive pressure — to invest the time and money in fancy marketing graphics or an online product catalog.

FRIEND OR FOE?

A crucial ingredient for Web commerce growth within a given country is a business- and Web-friendly government.

Malaysia's rapid Internet growth, for example, can be largely attributed to government policies "aimed at raising PC literacy, liberalizing the telecom industry and encouraging use of IT at all levels," Nikkei BP Biztech says.

Business-friendly, tech-savvy administrations have helped fund network infrastructure modernizations; pushed through privatization of telecoms and encouraged competition in Internet services; helped set up pilot Web implementations in urban areas; funded technical education programs; and lowered trade barriers to foreign technology imports.

Conversely, a repressive or overly protective government can keep Web commerce from blossoming. In China and, to a certain extent, Germany, administrations are attempting to control and censor user access to Web sites deemed pornographic or subversive. Government bureaucracy and red tape in southern Europe has slowed network infrastructure modernization and other innovations.

THE U.S. HAD IT EASY

Consumer-based electronic commerce on the Web overseas is running into the same user concerns and entrenched shopping habits that have slowed its growth in the U.S.: security concerns, the absence of common legal definitions for enforcing electronic contracts, particularly across national boundaries, and shoppers' preference to see, touch and feel many products before buying.

On the positive side, the same attractions and potential benefits that launched Web commerce in the U.S. are also drawing foreign businesses to the medium — only more so, in many cases. Indeed, many Third World countries "see the Web and the electronic era as a great opportunity" for economic and commercial advancement, says Doug Kaplan, CEO at Nikkei BP Biztech.

First, however, many Third World countries must overcome obstacles that U.S. businesses and Web commerce proponents never had to contend with: low PC and even telephone penetration, low average education and income levels and, sometimes, censor-ship-minded governments. Then there's the issue of primitive network infrastructure and the cost to Web-enable it: the network access lines, PCs, Web software and Internet services.

And in Europe, for example, artificial protections to local telco monopolies and businesses have kept prices of high-tech products high. European users pay 30% more for PCs than their U.S. counterparts, so PC penetration is much lower: only 12.5% of the population on average, according to The Yankee Group. In contrast, about 40% of the general U.S. population owns PCs.

Furthermore, telecom companies everywhere in Europe but in the U.K. charge by the minute for Internet access, making Web surfing an expensive pursuit at best. As a result, potential Web consumers "will only visit a site if they are getting something out of it, instead of surfing for the hell of it," says John Fox, head of editorial services at ABB Group, a Zurich-based manufacturer. That can cut down drastically on the number of shoppers who get to a commercial Web site by means of banner ads, URLs and search engines such as Yahoo.

Then there are the local shopping preferences, anxieties and habits that can effectively frustrate the Web efforts of local merchants.

Start Media Plus, a Frankfurt-based travel service, for example, has not been surprised to see few online bookings on its Web site, according to

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PHOTO: KEITH DANNEMILLER/SABA

WILL CEMEX CUSTOMERS *use the Web to buy cement? The company's poring over the idea*

of the continent and outside urban areas. The percentage of residents who even have telephones ranges from single digits for countries such as Bolivia and Brazil to 18.3% for Costa Rica and 21.1% for Uruguay, according to The Yankee Group. Education levels are low outside the upper 20% income bracket.

What counts with Web entrepreneurs such as Espuelas, however, is that Latin America is aggressively pulling itself up by its bootstraps — economically, technologically and commercially — and turning itself into an open global market in which Web commerce will play an increasingly key role.

INDICATORS THERE

International Data Corp., a research firm in Framingham, Mass., recently projected that Latin America would see the fastest growth in PCs in the world through the year 2000 and server sales growth of 60%.

The number of Latin American computers connected to the Internet is growing at a rate of 300% or more per year, according to recent studies. "That's a lot of growth," Espuelas enthuses.

Business Web growth has followed user growth.

Of course, the growth varies from country to country. "The hottest Latin American markets for the 'net are, in order, Brazil and Mexico; then Colombia, Chile and Argentina," says Carlos Perry, a program manager at Yankee Group's Latin American communications planning service.

Key growth drivers: Economies are improving, inflation is stabilizing and, perhaps most importantly, governments have become Web commerce proponents.

"The 'net is very much seen by governments in the region as a leveraging tool" for increasingly open and global Latin American markets, Espuelas says. "Governments have been fomenting competition through imports" by eliminating trade barriers and other artificial protections.

One result: "People can increasingly afford to buy a PC or pay a monthly Web access fee," Perry says.

Falling trade barriers are also forcing Latin American firms "to modernize their business practices and infrastructures in order to compete" with foreign companies for business both on their own turf and in the global marketplace, Espuelas says. And that definitely includes having a global market presence via the Web.

Take Cemex SA de C.V., a Mexican cement producer. "Right now, we are using the Web mostly for publishing information about the company and for recruiting services," says Ricardo Diaz, manager of evolution and technologies development at the firm. That's changing fast, however.

IT is currently working on software that would allow Cemex and its suppliers to exchange electronic data interchange documents such as shipping and change orders via the 'net. "The Internet would be a nonexpensive, faster, more productive connection to maintain the relationship" with business partners, Diaz says.

Cemex is still evaluating the idea of selling cement over the Web. "The question is, will our customers want to use the Web" for such transactions, Diaz says. "A lot of them prefer to deal with us personally, and a lot do not use the Web for business processes."

The company maintains its own Web page. "We didn't outsource our site because we have a lot of plans for it, and we have our own IT company," Diaz says. "In the cement business, we're pretty leading edge."

Commerce is opening up not only between Latin America and the rest of the world but also across the continent. For instance, southern nations recently formed Merco Sur, a loose confederation dedicated to fostering cross-border trade. Andean countries in the north are "doing similar things," says Yankee Group's Perry.

Governments are working together on the network infrastructures to support such trade, laying down fiber-optic terrestrial links across the mountains from Chile to Argentina and submarine cable connecting Brazil, Argentina and Uruguay along the coast.

National infrastructures are improving, too, aided by the privatization of government-owned telcos everywhere but Brazil and by investments in local telcos by U.S. carriers in countries such as Mexico.

Of course, "development rates differ among 18 countries," and in many areas, Web commerce in Latin America is still more potential than actual, Espuelas admits. In particular, it is coming very slowly to the poorer interior countries of jungles and mountains, which have not attracted foreign investment.

A common problem for Latin American businesses moving onto the Web is locating the expertise they need to exploit the Web, Espuelas says. For now, at least, "Latin America is fundamentally a technology consumer, not a producer."

"Demand for technical people outpaces supply," agrees Paul Shanahan, manager, user support, at the American Chamber of Commerce in Brazil (Amcham). "If you're a company whose business is not the Internet, it's rare for you to have internal 'net expertise." Instead, companies are outsourcing their Web sites to organizations such as Amcham.

Still, more sophisticated applications are beginning to turn up, particularly among the "soft" information-intensive industries. Banks, for example, are beginning to use the Web to attract customers through direct marketing, as a cheaper alternative to mailing printed marketing material, Espuelas says.

Maksoud Plaza hotel is one Amcham member that takes reservations and receives credit-card information via the Web, Shanahan says.

And there's a huge market to tap. Unlike Europe, where Web sites have to be tailored to each country's languages and customs, Latin American users all speak one of two very similar languages, Spanish and Portuguese, he adds.

This all adds up to a potential market of some 90 million consumers reachable via the Web, Espuelas says.

Perhaps most importantly, "there is no shortage of interest here in the Web: People are fascinated," Perry says. "This is a part of the world where people can't get information, period. Latin Americans are now being told they can find anything they want on the Web; there's a level of fascination that will last a long time."

ELISABETH HORWITT

Thomas Rodel, director of new distribution systems at the Start Holding Gmbh division.

"Online bookings are not as popular in Germany as in the U.S. because most people don't use credit cards. In addition, they are very worried about security on the 'net," he says.

What will initially attract users to the site, Rodel says, is easy access to information about travel services and packages. "We expect people to look at our offers on the 'net, then go to travel agencies around the corner and do the actual booking."

One of the major detriments to Web retailing is the heterogeneity of languages, monetary systems and shopping habits across large regions of the world. Such disparities are preventing the Web from becoming a truly global marketing and sales medium, particularly in Asia and Europe.

Within individual countries and in relatively homogeneous continents, however, Web-based consumerism is definitely on the rise, industry analysts say. In the U.K., for example, electronic commerce currently provides just 3% of sales, but companies expect that number to grow to 20% by 2000, according to a recent report from KPMG Peat Marwick.

INCREASINGLY GLOBAL

Language and cultural barriers have been much less of a hindrance to business-to-business communications, particularly in manufacturing and high-tech areas that share an industry-specific culture and language. Furthermore, while retailers tend to restrict their marketing efforts to a single country or region, industrial manufacturers, business services and suppliers are increasingly putting a global spin on their buying and selling.

For such globally oriented companies, the Web's independence in time zone, distance and location makes it an ideal medium for commerce and communications, according to Russ Craig, a partner at Andersen Consulting.

Take ABB Group, manufacturer of industrial and building products such as power transmission equipment.

"We use the Web to steer users to the

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YEAN FEE HO: *'Most [Singapore] households have a PC'*

PHOTO: PETER SERLING

ASIA

Beyond business enclaves, Web use is quick to take off – and has far to go

Asian factories build everything from sneakers to semiconductors. And their Western business partners want them on the Web. It lets them "shrink the time and cost out of the supply chain and update requirements," says Russ Craig, a partner at Andersen Consulting.

Supplier communication is only part of the Asian Internet picture. This is a land of contrasts — economic, political, cultural — and nowhere is that more apparent than on the Web.

Asia's 5 million to 10 million Internet users today are expected to grow tenfold to 100 million within five years, according to Nikkei BP Biztech, a Santa Clara, Calif.-based provider of business and high-tech news in Asia. But usage and business climates vary widely by country. Topping the list of Internet-friendly nations are Singapore, Hong Kong and Japan, in that order, says Jeevan Kumaran, marketing manager of Internet business in Digital Equipment Corp.'s Asia-Pacific region. He calls these countries prosperous, educated, globally oriented business centers with advanced telecom infrastructures and "a rate of Web progress similar to the U.S."

Until recently, Japan lagged somewhat behind the others, largely because products and support literature from the U.S. had to be translated into Japan-

ese, creating a lag in the newest releases, Kumaran says. Also, Japanese PCs used a nonstandard BIOS, hindering the use of U.S.-based Web products, though that has now changed, Craig says.

But Japan is now off and running, and it's in the land of the sun that consumer shopping appears likely to succeed. Japan already has the distribution setup to deliver goods. And consumers, who give a lot of gifts and must fight crowds in many department stores, are likely to welcome the medium.

General Electric Information Services chose Asia as one of the first areas outside the U.S. to launch its Trading Process Network, a Web-based supplier/manufacturing trading service. "We went to Asia because a lot of manufacturers in Asia want to get materials from a [Web-based] purchasing service," explains John Berry, a spokesman at the General Electric Co. subsidiary.

In contrast, in Singapore, "it is not the culture to purchase via mail order, much less via the Web, unless [the product] is not available in shops," says Yean Fee Ho, a manager in the IT division at Star+Globe Technologies Pte. Ltd., a vendor of multilingual information authoring and retrieval products. Star+Globe's Web site so far is just informational.

Yet Singapore, with 105,000 Internet users — the third-largest number in Asia, Biztech says — is installing ISDN cables in every home, and "most households have a PC," Yean Fee notes. She says Internet access charges are still high, though Biztech reports increased competition and a recent price war among providers.

Cost is but one of many hurdles in other countries, where Web deployment efforts are up against poverty, lack of education and primitive infrastructure. But efforts to rise above those obstacles are under way.

In Malaysia, for example, the government recently initiated a major drive to raise PC literacy, liberalize the telecom industry and encourage IT at all levels, Biztech says. But this has created a demand that the two major Internet service providers (ISP) have not been able to fill.

A MIXED BLESSING. Web commerce is limping along in Thailand because of huge fees levied by the Communications Authority of Thailand (CAT) on ISPs and a primitive telecom infrastructure, Biztech's Kaplan reports. ISPs pay CAT $40,000 per month for a 512K bit/sec. line — 60 times what ISPs pay in most other countries — and businesses must pay the authority nearly $5,000 a month to maintain a site, which accounts for the fact that only about 200 firms own sites, to date, a Biztech report notes.

Then there's the Chinese government, which despite well-publicized attempts to set up Internet filters is encouraging businesses and users to get on the Web.

Already, the efforts of different agencies and ministries have resulted in the deployment of not one but three national information backbones, according to Andersen Consulting.

"Where the government is infinitely involved in the infrastructure, you can get things done quickly," Kaplan says.

Indeed, many Asian countries have implemented modern network infrastructures faster than in the U.S., "where things are more decentralized and there are more legacy [network] systems" that must be modernized or replaced, he says.

Web business proponents and analysts, in fact, portray governmental influence as largely positive for that reason. "I have talked to progressives [in China] who are trying to pull [foreign] companies in for joint ventures and bring in technology, and they are very upbeat," Craig says. "They say the market there for PCs is bottomless. They didn't talk about government hard-liners or the chances of another Tianneman Square. They just said, 'Come on down!' "

ELISABETH HORWITT

EUROPE

Cultural, language barriers challenge the Continent

The global Web would be an ideal medium to reach a broader European market — if there were such a thing. As the European community remains culturally, linguistically and monetarily fragmented, so does European Web commerce — at least on the consumer side.

Business-to-business Web commerce is another story. Increasingly, global industries, largely undeterred by national boundaries, are using the Web for trade, marketing and information sharing, according to Chris Champion, an analyst at the European division of The Yankee Group, a Boston-based consulting firm.

Companies seeking a multinational Web presence still must balance the need to provide a single corporate image with the need to address the preferences, tastes and customs of different nationalities, analysts say. Take Kao Infosystems, which makes CD-ROMs and floppy disks for the software industry. The Kao Corp. subsidiary is putting up a European site to facilitate communications with its business partners. Jonathan Rawle, an IT manager, says his group is now figuring out how to design a site that "enhances the differences [between different countries], but not in a negative way that makes people scared of a bifurcated company."

Of the 17 million European Internet users, 7.5 million are business users or work for corporations, The Yankee Group says. Annual percentage growth rate of Web hosts is at least in the double digits across Europe, with countries such as Portugal, Belgium, Denmark, Spain and Italy seeing growth of more than 100%.

That's a challenge European Web retailers have been confronting for some ➤

right [product] area where they can get information appropriate to their needs," says Fox, head of editorial services.

With tens of thousands of offerings managed by 37 geographically dispersed business groups, "there is no way we can maintain an up-to-date, centralized product catalog at our group site," Fox says.

Instead, Fox's group provides a "general-level" product index at the central Web site, where customers can learn about the company and zero in on the "transformer or particular type of switch gear or relay" they want, he says. Then they can surf via URL link to the business division responsible for that type of product. And it doesn't matter in the least where in the world the user or the business group is located.

ABB is far from alone. Companies worldwide are getting on the Web to collaborate with partners on marketing campaigns and product designs; to notify customers of price changes, new features and products; to offer special deals; to track shipments and development cycles; and to locate suppliers and put out requests for proposals.

That last electronic-commerce application is among the fastest growing on the Web, nurtured by a growing number of Web-based supplier directories and other trading services.

The TDS Group and BT, for example, are jointly piloting a Web-based trading platform that includes an online product registry and supplier directory, based on software from Trade'ex Electronic Commerce Systems, Inc. in Tampa, Fla.

"I'd say with this initiative, the U.K. will become a leader of electronic commerce on the Web over 12 months," TDS's Gregory says. The company also hopes to link its U.K. service to Trade'ex-based services in other regions, creating a truly global Web-based trading system, he adds.

The first step, of course, is signing up a critical mass of business customers. Fortunately, Gregory says, "BT has a lot of marketing muscle and the resources to change the way people do business, which is what's needed to get EC really flying."

Horwitt is a freelance writer in Newton, Mass.

time. They must tailor their Web sites to match the language, culture and monetary units of a country or risk losing their audience, says Russ Craig, a partner at Andersen Consulting. "I keep having conversations with [European] clients on whether they can get away with English on the Web. And the conclusion is, you have to have the native language," he explains.

A couple years ago, Andersen Consulting studied electronic commerce and travel services and collected travel brochures. It discovered that while African and German brochures stressed adventure and danger, U.S. brochures emphasized nature and family. In short, they appealed to consumers in different ways.

Thomas Rodel, director of new distribution systems at Start Media Plus, can vouch for that. The travel services subsidiary of Frankfurt-based Start Holding Gmbh has been "focusing our Internet services on the German market right now because we think that any 'net-based offer should be designed for local users, and not only the language but the local flavor," he says.

Yet localizing services, as well as the low number of European households with 'net access (just 3.5% this year, The Yankee Group says), may deprive businesses of the numbers needed to succeed. "You need a critical mass [of potential customers] to be selling into any market," Yankee Group's Champion says.

Further, a European distribution network is a prerequisite for European marketing and sales via the Web, and few retailers have that, Champion says. An exception is Italian clothing company Benetton, "which has a well-developed distribution network in 90% to 99% of all European countries," he adds.

More typical is TV-Shop, a company started by Swedish conglomerate Kinnevik, which does mail-order TV shopping and recently started a Web-based online shopping network. "They advertise across Europe but sell only in a few countries because they have to have local distribution channels," Champion says. "It's prohibitively expensive to mail many of the products sold, like the Gut Buster, across so many domestic boundaries."

It's expensive for consumers to shop, too. Most telecoms in Europe charge by the minute for 'net access, so consumers "will only visit a site if they are getting something out of it, instead of surfing for the hell of it," notes John Fox, head of editorial services at ABB Group in Zurich.

Technology innovation in Europe can also be stymied by entrenched authority, Craig says. Government bureaucracy is the primary reason Italy has one of Europe's most primitive infrastructures, says Jupiter Communications, a research firm in New York. Government-supported telecom monopolies have kept network service prices up; high import tariffs have kept PCs and Web software prices high. Then there is the "not made here" syn-

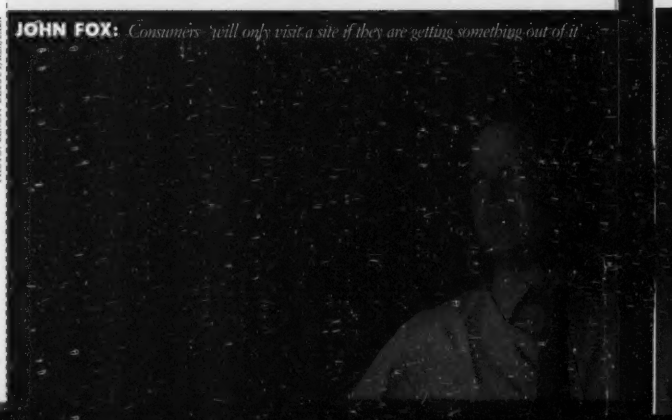


PHOTO: BENOIT DECOUT/REA/SABA

JOHN FOX: *Consumers 'will only visit a site if they are getting something out of it'*

drome: proprietary systems of local telcos and vendors perpetuating themselves at the Web's expense. The classic example is French users' refusal to abandon Minitel, France Telecom's text-based online service, for the carrier's Web-based equivalent, Wanado.

Yet some countries have a positive prognosis. A recent study by Forrester Research, Inc. in Cambridge, Mass., rated Germany, the U.K., the Netherlands, Belgium/Luxemborg, Austria, Switzerland and Scandinavia a 4 or 5 on a scale of 1 to 5 in terms of technology penetration and political climate — two of the study's three key indicators. While many countries rated a 2 on the third indicator — size of market — their growing trade with other countries gives them a favorable outlook, Forrester says.

Eastern Europe, meanwhile, is "behind the West in terms of economic development" but has potential for Web commerce, Jupiter says.

ELISABETH HORWITT

AUSTRALIA

A market with promise

In a recent address to a forum on electronic business, Alan Stockdale bemoaned the fact that while "many companies are using electronic marketing techniques, have a home page or are using other network IT applications . . . in Australia, generally, the current pace of activity in electronic commerce is too slow." Not only the U.S., "but even countries like Sweden and Ireland are using electronic commerce more extensively and more creatively then we are," says Stockdale, Victoria's treasurer and minister for multimedia.

But Stockdale's comments are indicative less of Australia's current rate of Web assimilation than of a prevailing attitude toward high tech in Australia: a determination to be firstest with the mostest, worldwide.

"We're known for our early adoption of technology," says Jon Mysel, principal consultant and general manager at The Hiser Group, a Sidney firm that designs Web user interfaces and does Web usability analysis for clients. For example, "Australia has the highest penetration of VCRs and mobile phones in the world."

Far more significant to Web commerce proponents, 4 million Australians in 2 million homes use computers, according to the Australian Bureau of Statistics. That's at least 20% of a total population of between 18 million and 20 million. And 55% of all households have PCs with CD-ROMs and modems, according to Mysel.

It's no surprise, then, that Australia has one of the highest per capita Internet usage rates in the world: 20%, up from 12% a year ago, says the Centre for Electronic Commerce at Monash University in Victoria.

The high Internet penetration rate helps make up for what Forrester Research in a recent report defined as Australia's major Web commerce weakness: a small regional population that translates into a limited market pool.

Indeed, Australia's user base makes up in quality what it lacks in quantity: English as a first language, generally high levels of education and disposable income and a well-established passion for consumer electronics.

A rapidly growing roster of Australian businesses are following those tasty consumer demographics right onto the Web.

JOHN McCANN:

PHOTO: TASSO TARABOULAS/SABA

Major customers of The Hiser Group in consumer areas such as banking, manufacturing and insurance, for example, "see the Web as a place to strategically position themselves and sell real products and services — not just market them," Mysel says.

And in the retailing sector, a growing number of sites offer users Web-based shopping all the way through to purchase, Mysel says.

One such site was launched last October by David Jones, one of Australia's oldest clothing and household goods stores. Co-developed with British advertising firm Saatchi & Saatchi, Australian Web developer The Harrow Group and Microsoft Consulting Services, the site incorporates Microsoft Corp.'s Windows NT 4.0, Merchant Server, Back Office and an SQL Server back end. Shoppers can browse through different sections of the online catalog or search the clothing, toys, housewares, food and drink or music departments by person, price range and keyword.

The company instituted its site "in an effort to provide our customers, especially those geographically isolated from one of our stores, with another way of viewing and purchasing our products," says Damian Eales, national home shopping manager at David Jones. "In particular, we did some advertising of our site in the print media in the U.K. and Asia so that relatives and friends of people living in Australia could use this service to purchase Christmas gifts over the Web" instead of paying to ➤

ship such products overseas.

Eales' major complaint with the Australian Web infrastructure is the lack of readily available, affordable bandwidth. "We can't send [users] the graphics we'd like" because response time would be unacceptable with current modem rates, he explains.

"The cost of telecommunications is inhibitive," with some services costing as much as 10 times the same offerings in the U.S., Stockdale agrees.

But improvements are on the way. Recently privatized telco Telstra Corp. and its young competitor, Optus Communications, are racing to lay fiber-optic cable to support high-bandwidth multimedia Web services right to the home.

Two factors are speeding this deployment. First, CATV is new in Australia, so there is no legacy copper wiring to rip out or depreciate, Mysel says. Second, 30% of the population is centralized in large urban areas, enabling carriers to reach a large user base with relatively small outlay.

On the business-to-business front, government agencies and business consortia such as Tradegate and the Australian Chamber of Manufacturers (ACM) are promoting the Web as a keystone of a regional effort to promote trade in the Pacific Rim. For example, they have "established an online site for marketing Australia's agricultural products throughout Asia working in partnership with agricultural and food industries in Victoria," Stockdale said in his recent forum talk. And the Melbourne Flower Market uses a Web-based auction system to sell to the Japanese.

"The Australian federal government has sponsored several [electronic commerce] awareness-raising initiatives," such as a pilot trading platform and product directory implemented with ACM, says John McCann, national business services manager at ACM in Melbourne.

"EC applications such as the Web-based trading environment provide a means of marketing and distributing Australian products efficiently both domestically and, more importantly, internationally," McCann says. In particular, it lets small to medium-size companies that "traditionally take two years to establish a product successfully in an overseas market" to establish a presence in two months, he adds.

One incentive to business Web deployment is the government's announcement that it will do all procurement "by electronic interface by the end of 1997," McCann says. "That's a $30 billion [Australian] market — quite a carrot. And the stick is, if you don't adopt the required technology, your competitor most likely will and, at worst, lock you out of the market."

ELISABETH HORWITT

SOUTHERN AFRICA

Slow start but steady growth

In all reports that analyze worldwide Web use, Southern Africa winds up at the bottom of the heap, if mentioned.

"The problem throughout Africa is that marketplaces are generally underdeveloped, so they have a limited attraction for major [foreign technology companies] to set up presences there," says Michael Portlock, an independent telecom consultant who works there. Further, "in many parts of black Africa, telecom systems are so bad that the likelihood of setting up any type of Internet capability is very low."

Indeed, a 1996 report by Jupiter Communications in New York said the number of Internet users in most African nations is only in the hundreds.

The big exception is South Africa, which already has about 500,000 Internet users and is expected to reach the 1 million mark by year's end.

By the turn of the century, the South African Internet site development and advertising market could be worth $215 million (U.S.), with online transactions exceeding the $425,000 mark, according to IDG South Africa.

"South Africa is the wealthiest of African countries, with the white minority possessing the overwhelming majority of capital," Portlock says. "That English is widely spoken is a factor in online usage."

South Africa also has a decent telecom infrastructure, at least in its major cities, he says. And major computer suppliers, which operated through agents in the apartheid era, are beginning to have direct involvement in the country.

Still, Web commerce is just taking off in South Africa. For example, Absa Bank recently set up a pilot program of the SET security standard for Web-based credit-card transactions. The pilot will involve merchants, Visa and MasterCard, and 50 credit-card users.

Absa has also set up Destiny Electronic Commerce, a joint venture with Nasionale Pers said to be the country's first secure "virtual mall."

The other three major South African banks have all recently introduced Internet-based services, including access to account balances and statements, account payments, interaccount transfers and checkbook requests and secure, online banking transactions.

While Web commerce remains a dim prospect for most of the rest of the region, there are some hopeful signs. "A lot of countries are developing cellular networks and their own satellite systems," Portlock says.

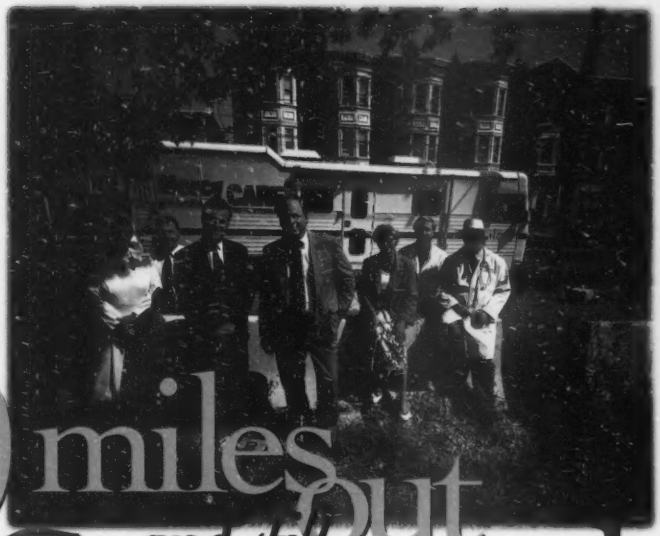
Tanzania is one of the areas outside South Africa where the Internet seems to be taking hold. "There are quite a number of companies/institutions providing Internet services there," says Hassan Ali, a Tanzanian expatriate now living in Canada. Heartbeat Online Tanzania, for example, started last December to offer full Internet services through a VSAT link to the Internet through France. The company charges a $200 access fee plus $50 a month (U.S.), which is fairly typical of rates there.

Web commerce is also taking off in Tanzania. "They are getting to the stage where corporations are developing big Web sites," Portlock says.

ELISABETH HORWITT

Remote Access[3]

The critical healthcare data network:



40 miles but *and still* Connected.

"Now we can reach beyond the four walls of the hospital with the highest level of care."
—Jack Hueter, CIO, Mercy Health System

Two years ago, Mercy Health Corporation of Philadelphia contacted Jack Hueter and offered him a major challenge – make Mercy a leader in the healthcare industry through networking technology.

His tasks: Put in place a scalable network backbone that would create a massive increase in operating efficiency, eliminate network performance problems, stabilize information transfer, allow for expanded off-site healthcare services and reduce the costs of operating expenditures. Wow!

Jack called 3Com. Working as a team, they made an assessment and then implemented a plan to successfully link 3Com's scalable technology with Mercy's current network. Together they connected six hospitals, various medical groups, ambulatory sites and finally, with the help of 3Com's connectivity solutions, several fully equipped preventative outreach vehicles were acquired to serve the citizens of Philadelphia.

"I've found my 3Com technology infrastructure to be the most important ingredient that we've put in place. It easily integrates and it gives us the ability to respond and grow," says Jack.

To be competitive in today's healthcare market and to extend your reach beyond the four walls of your hospital, contact a representative at 3Com, the leader in healthcare networks.

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Universal skills

WHETHER IT'S WANS IN INDIA OR NETWORK ARCHITECTS IN AUSTRALIA, THE CONSTANT IS DEMAND EXCEEDS SUPPLY

by LESLIE GOFF If there's one collective shout heard round the world as companies develop networking projects, it's this: Help!

Skilled professionals are in short supply.

"Many of the skills in demand here in North America are echoed throughout other First World countries, with maybe a 12-month lag," says Stan Lepeak, vice president of the Meta Group's Advanced Management Strategies service in Stamford, Conn. Microcosms of the supply-and-demand gap North American companies face are emerging across the board.

"Companies worldwide really need to look at their recruiting and retention strategies — from day care, to beers in the fridge to telecommuting and flextime — and they need to put together a whole package of tactics to locate these people and keep them on board," Lepeak says.

Here's a look at what companies in each region are, in fact, doing to find — and keep — valuable network staff members.

Goff is a freelance writer in New York.

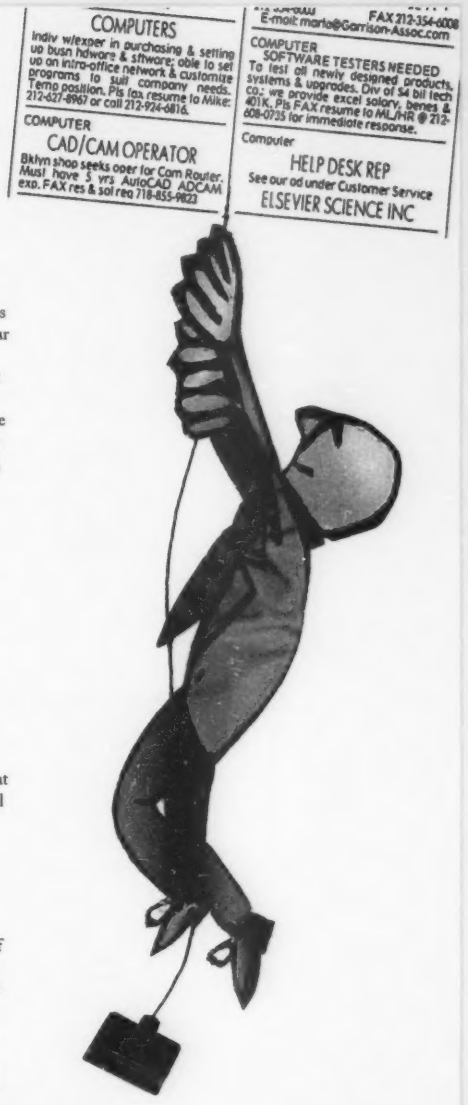
australia Seeking global network architects

Qantas Airways Ltd. supports a global network that connects its Sydney, Australia, headquarters with its offices on every continent. The airline is in the midst of reevaluating its technology infrastructure and how it deploys new systems across the board. But Des Kennedy, general manager for information technology infrastructure, notes that with a centralized staff of only 25 supporting its LANs and 12 working on the WAN, outsourcing the project is under serious review.

CW: Which networking skills are in high demand in Australia, and how difficult are they to come by?

KENNEDY: We need network design skills and, alongside those, skills in particular technologies like ATM switching. Also Novell and NT LAN skills are in

GAP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demand, depending on where companies are in terms of imple-mentation. We need Novell 4.1 because we use it as our main network operating system, but we use NT as our server operating system.

We're trying to hire people who have rolled LANs out in a complex environment like Qantas'. A lot of candidates claim to have the skills, but they don't have the depth of knowledge needed to take on a project here. We can get the skills locally, but because of the high demand, they can ask for really high salaries.

But when we were looking for a global network architect, we couldn't find anyone in Australia.

CW: What's driving these needs at Qantas?

KENNEDY: Our needs are exaggerated because we are reviewing all of our technologies and architectures at the same time. So while we're doing ATM and frame relay globally, we're also doing NetWare 4.1 locally. We're also reviewing our call center technology.

Qantas has suffered from a lack of investment in reskilling and in our infrastructure, but now we're committed to catching up. The IT focus wasn't high before, but management is well aware of the need to refocus, and we're thinking through how we can work that out. There's no question that as we move forward, we will have to have significant in-house training. Even if we choose (outsourcing), we will need additional skills to what we have now.

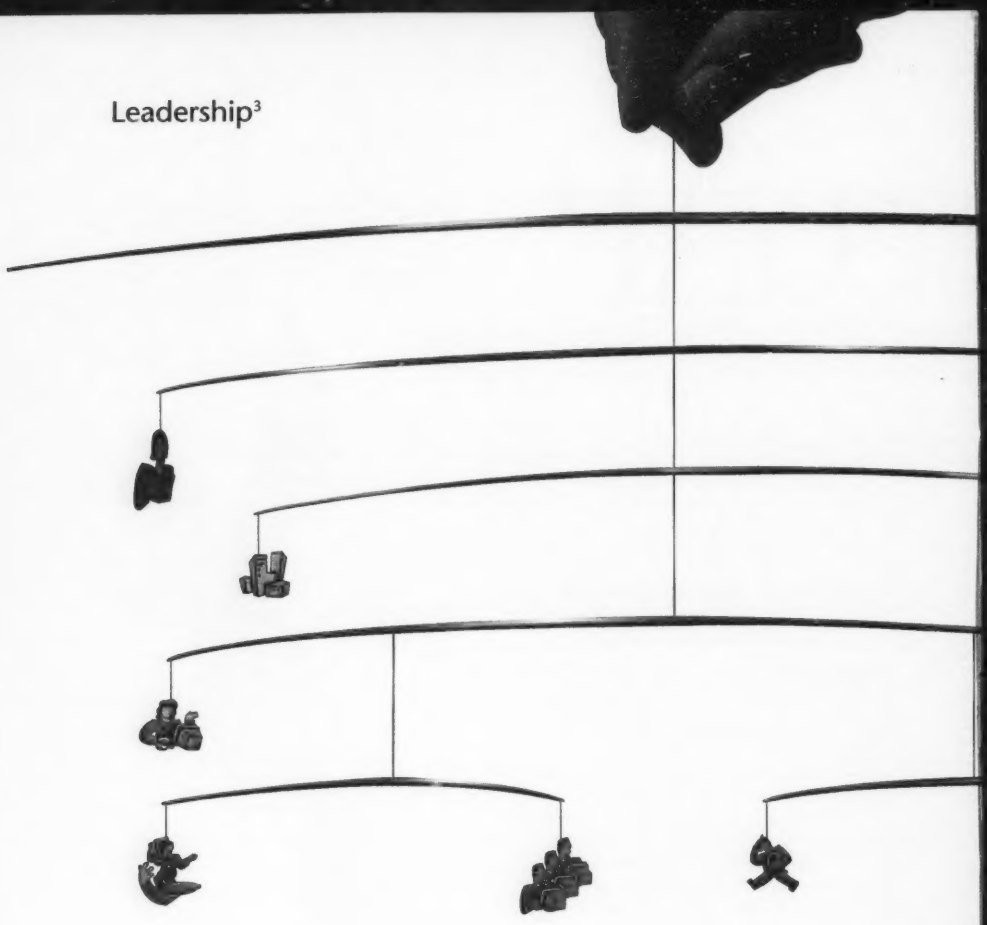
CW: What were you looking for in a global network architect, and how did you find the one you hired?

KENNEDY: We needed someone who knew the details of the airline industry, because we have unique protocols and relationships and they had to understand that environment very quickly. We have a lot of variation, business-critical applications, time-sensitive processes and communication protocols that are specific to the airline industry.

We found him through personal contact. [Our CIO] had worked for Air Canada, where he was working. It's very expensive, because we have to pay all his travel and personal expenses, but when we have the new global network in place, we'll recover those costs very quickly.

illustration by SCOTT MENCHIN

Leadership^3



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europe In Europe, e-commerce fuels demand

The growth of electronic commerce is swelling the networking supply-and-demand gap in Europe as companies transition their Electronic Data Interchange applications from private value-added networks to the Internet and look to leverage their Web sites for online transactions. Sven Hammar, president of Media Communications, a systems integration and consulting firm in Sweden, has worked on networking projects with IS organizations across the continent, including the Network 25's Stockholm Health Care Authority.

CW: What's driving the demand for networking professionals in Europe?

HAMMAR: The increased amount of Internet commerce here is placing an emphasis on people with both communications and security backgrounds. So, first, companies want Internet solutions and, after that, security solutions. They're realigning all their systems, including mainframe systems, toward the 'net, with more and more live applications on the 'net, like EDI and customer reservation systems — not just Web sites.

Web designers got a lot of attention for a while, but now we're seeing a shift from demand for Web gurus to more old-fashioned database and communication professionals who can provide applications migration and put real systems up on the 'net. Putting EDI systems on public networks is a very big thing here right now, for example.

The American export restrictions on security products has created a big gap in the products available to European companies, and they are using lots of consulting to develop their own security and encryption solutions.

CW: What specific networking skills and experience are European companies looking for?

HAMMAR: In terms of security, they're looking for people who have created virtual private networks, who have created secure environments for online transactions — including digital signatures — and who have practical experience in the use of encryption algorithms and the upcoming SET (Secure Electronic Transaction) standard. If someone has done one banking application, they can migrate their mind to a new one, and that market is expected to explode in the next year.

EDI experience is also in very high demand, especially people who have experience establishing EDI over the Internet, because the economic benefits of doing that are so high.

Traditionally, both Unix and NT have been in demand for LAN support, but now NT is gaining the advantage. When I have two candidates and one has a Unix background, and one has NT, I take the NT person because he has more time ahead of him. And if someone has had experience at some stage as an applications developer or has done database work, that's great, especially SQL Server, Oracle and Sybase.

CW: How are companies finding the skills they need?

HAMMAR: The demand is very high, and there are not enough people to do the job. So if companies already have the qualified personnel, they are usually developing bonus systems or stock bonuses to gain their loyalty. Otherwise, the salaries would just start getting crazier. I think there's been a 15% to 20% increase in these salaries over the last two years here in Sweden, and Swedish companies don't pay as well compared to those in other European countries. The average salary for an IS professional here would be equal to about $50,000 or $60,000 in U.S. dollars.

In Sweden, unfortunately, most people take jobs outside the country because salaries are higher and the climate is warmer. The big companies like Erikson and Volvo have to use large groups of consultants because they can't get full-timers.

latin america Looking for Internet pros

StarMedia Network, Inc. is the developer of a World Wide Web-based online entertainment service for the Latin American market (www.starmedia.com). Now expanding its service via several partnerships with television networks, the U.S.-based company is looking to deploy local operations and support in the top five Latin American markets: Mexico, Argentina, Brazil, Chile and Colombia. StarMedia is in talks with two potential outsourcing partners that would help manage the expanded infrastructure, but it also intends to hire its own local talent in each country.

Fernando Espuelas, chief executive officer, and Jonathan Hirschman, vice president of operations, are devising the company's hiring strategy.

CW: What networking skills do you envision needing in your local Latin American operations?

HIRSCHMAN: They'll fall pretty straightforwardly into server maintenance and infrastructure issues. We're platform agnostic, so we will likely require both NT and Unix skills. But we'll be focused on infrastructure needs as opposed to the applications expertise that we've

needed here, so it will come down to a basic hardware/software split. We'll also be looking for database administrators, but at this point, the exact positions are still being formulated, based on the future technology decisions we have to make.

ESPUELAS: Our needs will be fairly consistent across each country, but what will drive them will depend on the strengths of the partner we choose. We want an intelligent entity locally in each country to manage the process.

CW: How difficult do you anticipate it will be to find networking professionals?

ESPUELAS: Supply and demand is a concern. The IT infrastructure sector is booming throughout Latin America, so the types of people we'll be seeking are highly attractive to other companies in the telecommunications and networking business. We think we have an advantage because, due to the nature of our business, we provide a dynamic place to work without the encumbrances of a big corporation. Part of our strategy is to give every employee a stock option plan. We're able to give someone who's ambitious the chance to have equity in the company and to have an upside with our success.

CW: What recruiting strategies will you use?

ESPUELAS: We have an extensive network of telecommunications companies and Internet service providers that we work with, so we will use the referral system. We'll definitely seek to fill all the positions locally. We think there's a lot of value in having local players who understand the culture. In addition to their technical capabilities, we'll be looking at their ability to deal effectively with different Latin American businesses, because the business culture varies from country to country.

CW: Besides stock options, what else do you expect to offer in terms of salaries and benefits, and how will that influence your hiring plans?

ESPUELAS: In every country besides Brazil, salaries are 25% to 40% lower than in North America, so that's another reason why it's smart for us to deploy people locally. In Brazil, because of the way the currency is tied to the dollar, salaries are 100% to 120% of those in the U.S. market. So while that's important for us, we will try to hire fewer people there. Our largest contingents will probably be in Mexico and Chile, which are cheaper markets but have lots of talent.

india A good WAN (professional) is hard to find

When The Times of India, *the country's largest newspaper, rolled out one of the first wide-area networks in India in 1991, experienced WAN professionals were unheard of. So A. Peter, the publisher's general manager for information technology, hired five fresh college grads who had studied engineering and communications, and they immersed themselves in a baptism by fire.*

Today, the WAN encompasses The Times' *Bombay headquarters, the IS organization in New Dehli and remote offices in 50 locations nationwide. Each office runs on a Unix-based LAN that supports Windows 95 clients, with connectivity via TCP/IP over leased lines. Next year, Peter plans to add two positions to his networking staff to support a network expansion.*

CW: How has the networking landscape in India changed since you first implemented your WAN?

PETER: Most organizations now have Novell or other types of LANs. In the last year to 18 months, a lot of them have begun wide-area networking, so you can find trained people in the market now. But they're hard to get because there's more competition locally. And a lot of the best ones are migrating to the U.S. and some go to Europe.

CW: What retention strategies have you adopted?

PETER: Most are better paid than the market rate. In U.S. dollars, they make about $2,500 a month — salary levels overall are not that high here. Also, they are given flexible working hours, and they have a lot of autonomy. For example, most of our office people work 10 to 5, but we don't insist that the technical staff is in at 10 — they can come in at 11 or 12, and then work late into the evening. And since the network must be looked at on a 24-hour basis, and the entire business depends on the net being up, some of our senior tech staff have access from their homes. So if there's a problem on Sundays or holidays, they can probably fix it from home.

CW: What's the profile for your ideal networking candidates, and how do you find them?

PETER: At the junior level, we look at graduates in engineering who specialize in communications and maybe have one to two years of experience — but that much experience is very difficult to find. So we do campus recruiting. For senior-level positions, we do advertising. Sometimes we don't need to advertise. We are frequently a reference point when it comes to networks and network-based applications. So some good people who have not gone abroad will come to us and inquire.

One network DOESN'T fit all

The Internet may get all the attention, but companies have other conduits to deal with, too

DIFFERENT NETWORKS have different functions but one purpose: getting information where it needs to go. Here, a look at four pieces of the network pie, and the challenges users face around the world.

[INTERNETWORKING]

A twisted pair

by BOB WALLACE

WHEN WORKING OVERSEAS, RELATIONSHIPS, RATHER THAN TECHNOLOGIES, DETERMINE WHETHER YOUR PROJECT SUCCEEDS

Users looking to build LANs outside the U.S. will find that technology takes a backseat to selecting value-added resellers (VAR) and learning the socioeconomic lay of the land.

Researchers say that there really isn't a shortage of switching and routing equipment around the globe, but that more advanced countries — England, France, Germany and Japan — make wider use of the latest technologies than other nations. The technologies available largely mirror those available in the U.S. Switched Ethernet, Fast Ethernet and Asynchronous Transfer Mode have been deployed in many places and continue to pick up speed.

On the WAN side, countries with less developed infrastructures can have an advantage in that they can often leapfrog an evolutionary network stage and more quickly deploy more advanced technologies, if they have the money.

Interoperability is not a grave concern, as most large multinational or global firms have standardized on one vendor's equipment. In fact, Mark Maxwell found that picking the right reseller and cabling management firm was a bigger undertaking than selecting and buying internetworking equipment.

"It can be the difference between a successful project and something that makes you very unhappy," warns Maxwell, global systems manager at Fuji Capital Markets Corp., a trading firm in New York. "You have to do a lot of research up front to make sure you and they see eye to eye. You can design the most beautiful network, but if the people you pick to support it aren't up to par, they can destroy it."

Maxwell succeeded, ➤

illustrations by JAMES F. KRAUS

and redid the trading floor in London last year and recently finished one in Hong Kong. The facilities use a 100M bit/sec. Fast Ethernet backbone and switched Ethernet toward the desktop.

Air Products and Chemicals, Inc. took an alternative path and decided to work with its supplier — 3Com Corp. — and VARs in the 90 countries in which the Allentown, Pa., firm operates. Its global networks support merchandise tracking and back-office applications.

"We build relationships through 3Com with its VARs, and they tend to work out well because the VAR typically has a very good idea what needs to be done," says Virgil Palmer, director of telecommunications and networks at Air Products, a worldwide supplier of industrial gases, specialty chemicals and associated equipment and services. "We used VARs to handle a turnkey installation in Singapore, for example." He says the VAR handled just about everything, from LAN setup to testing and certification of the equipment and cable plant in the Singapore office.

Learning about the socioeconomic ways of the regions in which you wish to build is also a must, according to Chuck Rush, global network architect at McDonald's Corp. in Oakbrook Terrace, Ill.

"We found doing business in Latin America a real pleasure, because a large group of countries share the same heritage and business outlook. What that means is they help each other on big business projects," Rush says. The fast-food giant operates in more than 100 countries, including Russia and those in Eastern Europe.

Each store has a shared Ethernet LAN for its roughly 50 employees. (Rush can't justify higher speed schemes unless the number of employees climbs significantly.) The stores are linked primarily via a worldwide frame-relay network, which lets them communicate to McDonald's headquarters in Oakbrook Terrace.

The Home Depot, Inc. plans to open a store in Chile soon and was extremely pleased with the reception it received from the country.

"They welcomed us with open arms and are working on ways to make the

[MESSAGING]

Integration is

A SINGLE NETWORK AND COORDINATED SOFTWARE IS A GLOBAL GOAL

by SURUCHI MOHAN

Robert Brown is looking seriously at E-mail integration. Currently, he sends 90% of his electronic mail as ASCII text on Novell, Inc.'s Message Handling Service with Da Vinci Systems Corp.'s email. All other data traffic uses a proprietary IPX network. But this scenario has to change, says Brown, assistant vice president of information services at Queens County Savings Bank in Flushing, N.Y.

As users ask for more capabilities on the desktop — such as sending complex E-mail attachments — and administrators cry for fewer networking headaches, integration of messaging with the networking infrastructure and of E-mail and desktop applications looks ever more appealing. That's what Brown, who recently completed a frame-relay network to bump up bandwidth and relieve congestion, says he will do next.

And while regional differences do exist where messaging is concerned, many of those distinctions relate not only to an organization's E-mail past but to its technological future. Integration often starts at the network level, where disparate networks are integrated into one. It then moves into the client and server environments, with software suites that often include E-mail capabilities.

When Dennis Murray contemplates extending global E-mail capabilities throughout his company's 70 offices worldwide, he has to remember that network capacity and equipment is far more limited and less sophisticated outside the U.S. "We have been leveraging the messaging layer in foreign countries. It hasn't been easy," says Murray, head of cooperative technologies for clinical development

project a success," says Bradley Albers, senior manager of information services at Home Depot in Atlanta. "You need all the help you can get when setting up shop outside the U.S."

However, that phenomenon doesn't apply to all regions, McDonald's Rush adds. "Working in Eastern Europe and Russia is a challenge at best, because there really isn't a common mindset among countries for handling international networking," Rush says. "And some countries are much better off financially than others. You'd think China would be one of the others, but their market is strong, and they're very industry-minded."

Skip MacAskill, a senior analyst at Gartner Group, Inc., a global research and consulting firm in Stamford, Conn., says Australia is very advanced. "But the emphasis in networking in Australia is the WAN, not the LAN. That's because the continent has most of its population located in far-flung cities and has to use undersea cables to reach every other country," MacAskill adds. "It's something global networkers need to be aware of."

On the intranet front, the U.S. holds a commanding lead, largely because bandwidth is far more plentiful and affordable and there's no shortage of service and support staff for these networks. But on the downside, U.S. firms looking to extend their intranets beyond the U.S. can expect slow going.

For the future, users can expect the international LAN infrastructure industry to improve. That's because the top internetworking vendors count on international sales for a larger part of their revenues and are investing more in building up their VAR networks, says Tam Dell'Oro, founder of The Dell'Oro Group, a Portola Valley, Calif., research and consulting firm.

"International sales account for almost half the revenues of Cisco [Systems, Inc.], 3Com and Bay Networks [Inc.]," Dell'Oro says. "Obviously, this is a huge growth area, which means vendors will invest heavily in their international operations."

Wallace is a Computerworld senior editor, internetworking.

the name of the game

and regulatory affairs at Novartis Pharmaceuticals Corp. in East Hanover, N.J. He notes that he's not yet ready to consider adding audio and video capabilities for this very reason.

Like many network managers, Gilles Simon, electronic communications manager at SGS Thomson Microelectronics in Saint Genis, France, is seeking E-mail stability. Between 1993 and 1996, Simon's mission was to merge his company's three legacy E-mail systems into one corporate backbone. What followed was a TCP/IP network, first on X.25 and now on frame relay and Hewlett-Packard Co.'s OpenMail with a Lotus Development Corp. CC:Mail client. Integration at the desktop is looming large on the horizon as well.

In addition to the ability to send complex documents as attachments, "people want group calendaring/scheduling and task management," Simon says.

Also pushing the integration trend are vendors, ever bringing new technology to market in an attempt to create a need for their offerings.

Corning, Inc. was 100% Digital Equipment Corp. All-In-1 until about 1995, when small islands of Microsoft Corp.'s Mail sprouted up, and local departmental servers came into being to support them, says Greg Di Iorio, manager of Internet messaging technologies in Corning, N.Y. Lotus Notes also mushroomed in small pockets, and in 1995-96, Corning was going full steam ahead with two parallel networks. That's when market pressures to go with groupware began to be felt.

"We saw the convergence of groupware. In 1996, we said, 'we have to pick a product; we can't build everything in stovepipes,'" Di Iorio says. Once E-mail standards take hold, traffic on the network increases, as users attach files from spreadsheets to audio and video clips.

But E-mail isn't an essential part of business everywhere. At The Hongkong and Shanghai Banking Corp., "if your E-mail fails, the business probably is not going to fail," says Tim Cureton, senior manager and head of group telecommunications in Hong Kong.

Still, E-mail has become a part of doing business at many companies. At Telia Data AB in Stockholm, E-mail "has become an important part of information distribution within companies," notes Kenneth Mattsson, technical manager for messaging products.

And wherever that's the case, says Tim Sloane, an analyst with Aberdeen Group in Boston, companies should look at "list servers [and] report generators that use that infrastructure to make sure it is leveraged."

Mohan is a freelance writer in Los Altos, Calif. Juha Saarinen, a freelance writer in Auckland, New Zealand, contributed to this story.

[WANs]

Devising a WAN plan

USERS AROUND THE WORLD ARE BUILDING AND DEPLOYING 'BUSINESS-CLASS' NETWORKS

by MICHAEL DORTCH

The wide-area networking (WAN) paradigm of choice around the world appears to be Asynchronous Transfer Mode (ATM) over optical fiber. This combination offers many enterprise users the maximum cost-effective combination of bandwidth, scalability, flexibility and support for a wide variety of well-established networking and applications protocols.

How close organizations get to this networking Holy Grail, however, depends in large part on where they're starting from.

In Asia, as in Africa and Latin America, bandwidth is usually very limited, and very expensive where it is available, according to Hong Chen, CEO of AimQuest Corp. in Milpitas, Calif., which has developed a global network of Internet service providers (ISP). A T1 line run for a few miles can cost thousands of dollars in Taiwan or elsewhere in Asia, compared to hundreds per month in the U.S.

In China, users are charged based on the number of characters they transmit, which can make data communications services prohibitively expensive, especially for users of data-intensive applications. However, since many regions in Asia have little infrastructure in place, they are moving directly to frame relay and ATM over fiber-optic lines, which should lower networking costs and expand available options within a few years.

In Europe, WAN options — including the Internet — are more widely available. Several ISPs have recently announced plans to build high-capacity points of presence across the continent. Since the vast majority of today's international Internet traffic is routed through the U.S., more POPs in Europe will increase worldwide Internet capacity and decrease transmission delays in and around Europe.

And in North America, high-capacity networking alternatives are widely available, although local carriers are decidedly inconsistent in their understanding and ready provisioning of such services.

Users, therefore, are justified in feeling a bit of despair in response to the roiling forces buffeting their WAN plans.

Despite the conflicts and confusion, users around the world are building and deploying "business-class" networks. Here are some brief glimpses into their strategies, successes and challenges.

IN BRAZIL:

To establish a WAN among its Brazilian and foreign offices, Companhia Vale do Rio Doce (CVRD), the world's largest producer and exporter of iron ore, works with a combination of the Brazilian national telco, EmBratel, its own railway system and foreign carriers. The local railroads, which CVRD owns, are the only companies in the country other than EmBratel to own infrastructure.

EmBratel and the railways link CVRD's offices in Brazil with

technology including fiber-optic and satellite links. AT&T and Embratel run the Diginet point-to-point, 64K bit/sec. link between New York and Brazil. The New York-Tokyo link is a frame-relay connection managed by AT&T and KDD of Japan.

IN HONG KONG:

In the late 1980s, when it changed its analog circuits to digital, The Hongkong and Shanghai Banking Corp. (HSBC) initiated minimum-level-of-service agreements with the telcos it deals with around the world. And HSBC sends a monthly "report card" to each critiquing the previous month's service, notes Tim Cureton, head of group telecommunications.

HSBC has found that as a multinational firm, it often had to play a mentoring role for its telcos, as they began doing business outside their traditional domestic markets. "[The carriers] lack global cohesiveness, and, often, a transnational corporation such as ours is much better at it," he says.

The company has found that mentoring and service agreements provide more reliable networking than dependence on so-called "global" alliances. " 'International' to most carriers means London, New York [and] Tokyo," Cureton says.

This presents a paradox to companies such as HSBC. Emerging markets, the places where the company's potential margins and profits are highest, are also the places where public networking infrastructure is often the least well developed. This situation requires multinational corporations ultimately to be self-sufficient in delivering full access to their affiliates, Cureton notes.

IN AUSTRALIA:

"Mulligatawny" is a popular soup from Australia, containing an interesting mix of ingredients. Qantas Airways Ltd., the national airline of Australia, is implementing a similarly mixed solution to its WAN needs.

Frame relay is being introduced across the company's network environment as the primary wide-area data-delivery method. The core of the "campus" networks in Australia is going to be ATM, but overseas and in the outback, where ATM isn't supported, the airline will use frame relay. Links to developed offshore areas such as London or the U.S. will be via leased lines running ATM protocols, while ISDN links will provide backup switch connections.

Qantas will lease lines from carriers where service levels can be guaranteed and implement private circuits where carrier inadequacies dictate, within budgetary reason.

Dortch is a freelance writer in San Francisco.

[WIRELESS]

Remote but not removed

UNTETHERED USERS STAY IN TOUCH WORLDWIDE VIA VARIOUS TECHNOLOGIES

by MINDY BLODGETT *and* KIM GIRARD

Wireless communications — that group of technologies that includes cellular and satellite, among others — may be struggling for acceptance in the U.S., particularly where sending and accessing data is concerned. But users in other parts of the world are increasingly forsaking terrestrial ➤

lines and turning to wireless to satisfy their mobile needs.

Industry analysts, for instance, estimate that globally, more than 125 million subscribers — two-thirds of them outside the U.S. — used some form of cellular technology for mobile communications last year, triple the 1994 figure of 41 million worldwide subscribers.

GLOBALLY, MORE THAN 125 MILLION SUBSCRIBERS USED SOME FORM OF CELLULAR TECHNOLOGY FOR MOBILE COMMUNICATIONS LAST YEAR, ANALYSTS ESTIMATE.

Even in the U.S., the market for wireless business systems is expected to grow from $126 million this year to $958 million in the year 2000, according to Phillips InfoTech, a telecommunications consulting firm in Parsippany, N.J.

But as the numbers of wireless and mobile users grow, users the world over share some common problems, including the high cost of service, the lack of technology standardization and the difficulty of roaming.

STANDARDIZATION EASIER

The issue of standardization is less cumbersome in Europe and Asia than in the U.S. In Europe and throughout Asia, the most prevalent wireless technology is a type of cellular called the Global System for Mobilization (GSM). While GSM is used primarily for voice, its providers hope to evolve it into enhanced data and Internet connectivity services as well.

Craig Mathias, an analyst at the Farpoint Group in Ashland, Mass., says GSM is available in about 75 countries. The advantage of GSM in Europe is that there is only one standard in use, which eases problems with roaming and interoperability between competing services. In the U.S., there are multiple standards for GSM, as well as for other forms of wireless communication.

Overseas, GSM is easier to use, as one computer-aided design (CAD) company has found. Intergraph Corp., a $1 billion multinational workstation and software manufacturer, has assigned its salespeople and service engineers in Germany notebook PCs and GSM phones. Using a GSM phone on Mannesmann AG's D2 GSM network, employees can call into the office and connect to a remote-access server by clicking on a Windows 95 icon. This initiates a call from the GSM phone to an ISDN line, enabling the user to get on the network. The system also enables callers to leave messages on a toll-free number; these can then be forwarded in text to the engineer's GSM phone.

While this approach can work abroad — in Germany, for example, 100% of the population is covered by GSM — what's holding wireless back in the U.S. is cost and a lack of knowledge of its benefits, Mathias says. "Lots of companies are learning about it the way they had to learn about PCs and LANs," he says.

An increasingly popular device running on GSM is the "smart phone," which combines voice, data and computing capabilities in a small handset. Recently, Motorola, Inc. announced the first GSM dual-mode phone, which works with other wireless technologies as well. The Nokia 9000 communicator, a smart phone from Nokia in Finland, has been very popular in Europe as well.

Another wireless technology gaining popularity in both the U.S. and Europe is Code Division Multiple Access (CDMA). U.S. wireless device manufacturers, such as Qualcomm, Inc. in San Diego, are pushing this to be the standard.

WHERE THE SAVINGS ARE

Many companies are using international intranets or satellite communications to avoid the expense of local infrared or remote cellular communication, both of which are prohibitively expensive, industry observers say. For instance, Ethernet PC cards offering 10M bit/sec. connections cost about $50, while a wireless network interface card is about $500 and gives only 1M to 2M bit/sec. connections.

No longer considered solely a medium for backup transmissions, satellite use is increasing in the U.S. For instance, Wiest Truckline in Jamestown, N.D., is using a hybrid satellite and wireless data system from Rockwell Semiconductor Systems, Inc. and The Ardis Co. The company replaced its cell phones with 52 remote units installed in trucks. The system, which uses the global positioning system (GPS), a shared satellite system, enables dispatchers to track truck locations by computer. Truckers, who use a keyboard installed in the truck, can send and receive delivery information.

"Purchasing the [remote] system [and leasing satellite time] is more expensive, but when you look at the control you have, it pays off in the end," says Kristina Huebschwerlen, the company's financial controller. Though each system costs about $4,000, the company no longer pays cellular bills, which could run up to $700 a month for just one truck. Although roaming cellular service can be dicey, truckers can always be reached on the road with the satellite system.

Regardless of the new wireless technologies emerging in the U.S. and abroad, Mathias says satellite will likely remain the more popular technology in the coming years, as many competing companies will make the service affordable and enable users to communicate from anywhere in the world. But cellular communication will also have its place, he says.

"Eventually, you'll be able to send faxes and data with handsets," he says. "They'll really filter into the business and consumer market."

Girard is a senior writer, mobile computing, at Computerworld. Blodgett is a former Computerworld senior editor.

THE CHALLENGES AND ACHIEVEMENTS OF SOME NETWORK 25 COMPANIES

Nets *around the world*

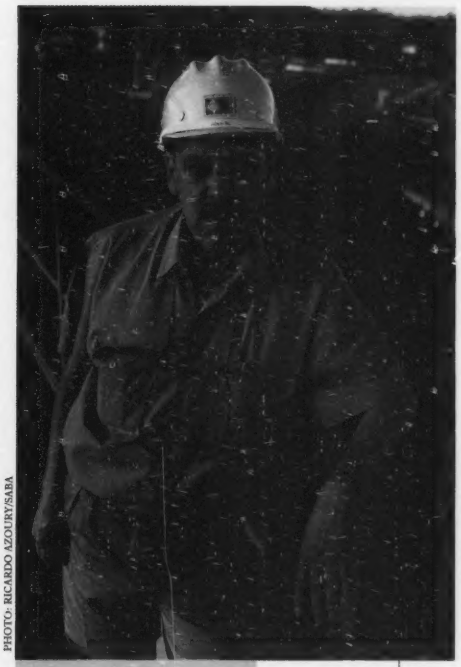


PHOTO: RICARDO AZOURY/SABA

TADEU GUIMARAES *In retrospect, CVRD would have done some things differently. "If we were building the network now, certainly we would implement frame-relay technology instead of point-to-point protocols."*

IRONCLAD CONNECTIONS

BRAZILIAN MINE'S NETWORK HELPS MOVE ORE

by MARC FERRANTI

When a shipping office in Tokyo wants to know the status of an order of iron ore coming from the depths of an Amazonian mine, chances are the information will be transmitted over Companhia Vale do Rio Doce's (CVRD) global network.

That's because Brazil-based CVRD is the world's largest producer and exporter of iron ore and has constructed a voice and data network, dubbed CVRDNet, to track material and manage logistics for its vast railway and port systems.

Four years ago, CVRD embarked on the mammoth, mission-critical application and networking project that last year resulted in CVRDNet. The total cost hasn't been calculated, because of Brazil's skyrocketing inflation during some periods of the four-year project (up to 100% per month, says one company official) and the project's multiple phases. ➤

"All the aspects of building the network were difficult," recalls Tadeu Guimaraes, marketing department manager for CVRD's information systems management group. "The most difficult thing is we had several layers of hardware and software and several suppliers — it's a heterogeneous environment." Working with suppliers as partners and having a skilled networking team helped, he says.

CVRD transports ore from mines to ports along the railway systems it owns in Brazil: the northern 890-kilometer Carajas Railroad from the Amazon region to the Ponta da Madeira Marine Terminal, and the southern 700-kilometer Vitoria-Minas Railroad running from the state of Minas Gerais to the Tubarao Marine Terminal.

The railways carry 100 million tons of ore per year, not to mention 50 million tons of commercial freight and 2.5 million passengers.

On the application side, several host-based programs were developed to control railway and shipyard logistics. One application schedules trains, using an in-house developed, fuzzy-logic artificial intelligence system. Other modules monitor trains as they're moving, manage passenger reservations and control ship loading.

On the network side, CVRDNet links the company's geographically dispersed Brazilian offices to the host-based applications and lets them communicate with offices around the world. However, only Brazilian offices, including those in Rio de Janeiro, Vitoria, Sao Luis, Carajas, Itabira, Belo Horizonte and Aracaju, have direct access to the tracking applications.

The foreign offices use Lotus Development Corp.'s CC:Mail over CVRDNet to query Brazil offices about the status of orders.

The host applications run and store data in an IBM CMOS processor-based mainframe running the DB/2 database on the MVS operating system. Users access the data via terminal emulation over CVRDNet, a multiprotocol network incorporating TCP/IP, IPX, SNA and NetBIOS. Connections include 2M bit/sec. microwave connections from Embratel, the national carrier, as well as fiber-optic links and lines laid along the CVRD railways.

The international side of CVRDNet consists of various types of connections among offices in Brazil and New York, Tokyo, Shanghai and Brussels, using different telecommunications companies and technologies.

For example, the Brazil-New York connection is a dedicated, point-to-point 64K bit/sec. link managed by AT&T and Embratel. The New York-Tokyo link is a frame-relay connection managed by AT&T and KDD of Japan.

Other links include a Brussels-Brazil connection managed by the Belgian national carrier Belgacom and Embratel, while the Tokyo-to-Shanghai link is set up using Infonet Services Corp.

CVRDNet and the related materials-tracking applications have had numerous benefits, according to Guimaraes. Among the main ones has been increased customer satisfaction as customers were kept better informed about order status at a time leading up to the privatization of CVRD, which was completed this year. Secondly, better control of railway logistics has reduced train breakdowns.

In retrospect, some things would have been done differently, Guimaraes says. "If we were building the network now, certainly we would implement frame-relay technology instead of point-to-point protocols" throughout CVRDNet internationally, Guimaraes says.

This is because the next big IT project involves moving to client/server technology, with more of the application data residing in local offices on Oracle Corp. databases, Guimaraes says. To do this, CVRD will have to upgrade CVRDNet with frame-relay links worldwide.

"The client/server migration is being done mainly to align our systems with the market — our users' — requirements, increase productivity in back-office operations, [and] add more value to the company's businesses," Guimaraes says.

Ferranti is New York Bureau chief for the IDG News Service.

DRILLING

INTRANET FUELS UPGRADES AT BP

by RON CONDON

At U.K.-based British Petroleum, experts in the exploration and refining of oil and associated products can be at opposite ends of the earth. That's why BP is rolling out a global intranet and using desktop videoconferencing to create virtual teams.

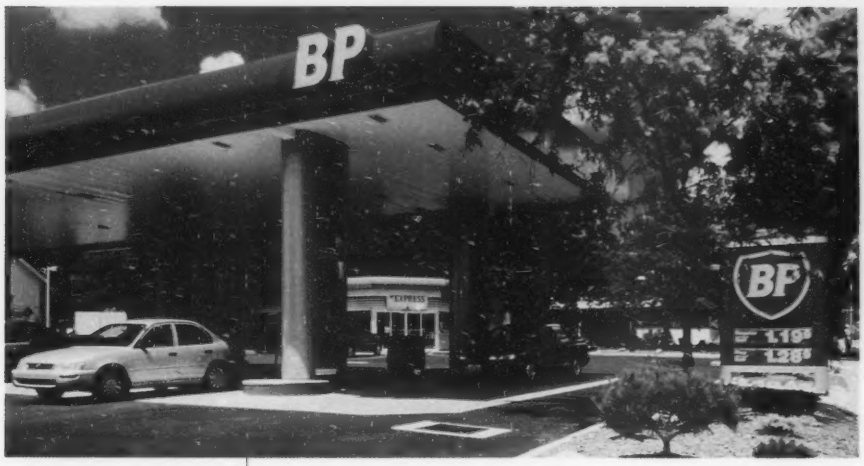
"The main benefit is the way BP can operate in distributed teams, gaining access to people and information wherever it resides and by networking around the globe," says Andy Haywood, BP telecommunications team leader. "It allows them to form focused groups looking at refining, IT or any other aspect of the business."

BP is now in the midst of upgrading its 32,000 PCs in 100 countries to ensure they all run Microsoft Corp.'s Windows 95, Office and Exchange and are all equipped with a Web browser to access the intranet.

In 1996, BP had a $500 million information systems budget, $90 million of which was spent on networks. Its IS staff totaled 750 and its networking staff 20, with additional positions that were outsourced.

With the upgrades, the intranet and the emphasis on videoconferencing — 950 users have Intel Corp. ProShare for videoconferencing and application

FOR DATA



PCs are used at BP's 8,000 gas stations in the U.S. to process orders, track competitors' pricing and communicate with other parts of the company. The boxes are being upgraded as part of the companywide effort.

sharing — Haywood says the company has yet to predict where bandwidth needs to be increased on the network. "We don't want to provide bandwidth just in case there is demand, nor do we want to provide [it] just too late," Haywood explains. "The target is to provide an acceptable performance just in time."

But the company does know that frame-relay managed services figure prominently in its overall plans. That's because they are scalable and flexible — as well as cheaper than leased circuits. Where necessary, ISDN will be used to provide extra bandwidth for videoconferencing.

"We are looking to use techniques such as RSVP [Resource Reservation Protocol] to give us some degree of quality of service across the network. The alternative could be ATM in certain areas — but that is not currently in the plans," Haywood says.

BP used to have its own private communications networks, but most of these have now been replaced by managed services from communications providers, allowing BP to focus on its core business.

The promised liberalization of world telecommunications will help this process, and BP would eventually like to work with a global provider, though even now the main contenders for that mantle — BT/MCI, AT&T and partners, and the Global One consortium — do not reach every corner of the globe.

The standardization push also extends to the supplier level. In the past, decisions were made locally, resulting in different divisions ending up with different equipment.

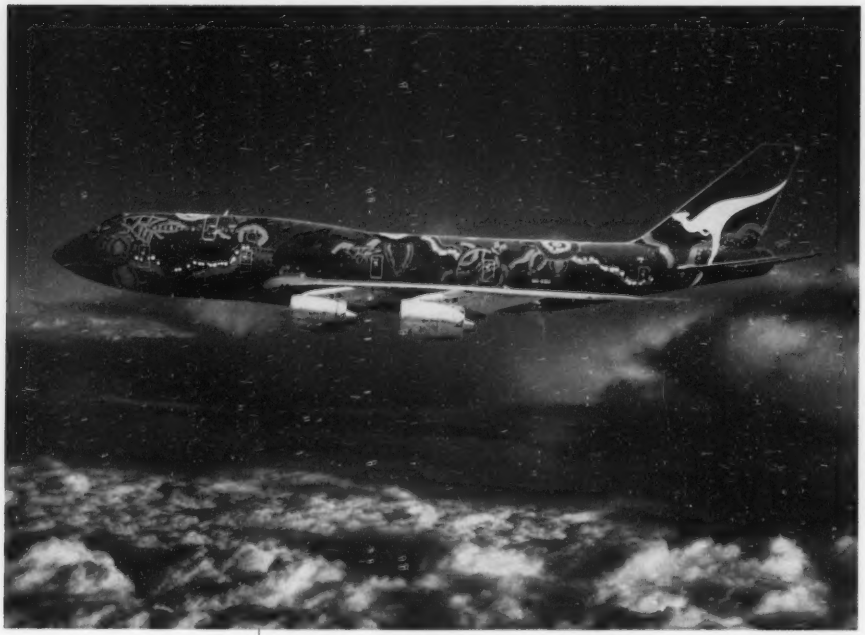
For example, while the company uses a mix of equipment from 3Com Corp., Bay Networks, Inc. and Cisco Systems, Inc. for its internetworking needs, the plan is to choose a single supplier that is capable of providing and supporting products anywhere in the world.

The next stage in communications development, according to Haywood, will be the creation of extranets to allow communications with customers and suppliers, but this is still in a pilot stage.

Condon is London correspondent for the IDG News Service.

READY FOR TAKEOFF

AIRLINE'S NEW NETWORK COMES OUT FROM DOWN UNDER



Qantas' multicolored Nalanji Dreaming design debuted in 1995 to celebrate the balance and harmony of nature in Australia. The airline is seeking to balance its functions on a new network, as well.

by JON SKILLINGS

The route map in the in-flight magazine doesn't exactly correspond to the network layout at Qantas Airways Ltd., but it's a good place to start in understanding the extent of the company's IS challenge.

A $5.7 billion (U.S.) company and the 10th largest airline in the world, Qantas runs 4,200 flights per week to 96 destinations throughout Australia and around the world. Wherever its planes land, it has employees — flight staff, reservations agents, mechanics — who depend on a network that needs to be as streamlined and efficient as a modern passenger jet. Without it, they couldn't book seats, check in passengers or move meals or spare parts, among other functions.

The Sydney-based company has started to redesign its transaction-based

network, propelled by its 1992 acquisition of Australian Airlines, its own accelerating growth and the sheer accumulation of older technologies.

Consider, for instance, the protocol stew at Qantas, currently a mix that includes TCP/IP, IPX, Unisys LLC, Unisys U100, SLC, Synchronous Data Link Control and X.25.

The yoking of the two airlines' networks also made significant cost and reliability demands at the same time that new technologies and bandwidth requirements cried out for attention. Of its $220 million information systems budget for 1996, $75 million was earmarked for network projects.

"We're doing a complete revamp," says Michael Dodd, Qantas' manager of technical services. "We're going to rebuild from scratch using contemporary technology to carry us forward."

The first parts of the new client/server arrangement, which will be in place by December, equally affect the three components of the network — campus, national and international. They will be connected via a fully redundant, high-capacity backbone. The new network will move Qantas onto a single protocol, TCP/IP, phasing out legacy protocols over time. The hierarchical design will have core, regional and site layers, and connection to the core will be at E1/T1 speeds or faster. Ethernet and Fast Ethernet will be the interim switching solution, followed by a migration to Asynchronous Transfer Mode (ATM) as it becomes widely available. Full internetworking between frame relay and ATM will be required.

REQUIREMENTS ANALYSIS

The project started months ago, when the redesign team set out to understand what the business units wanted and where they saw themselves going. The goal: To give Qantas a network that is strategic and supports the business, Dodd says. The process suggested essential elements of the redesign and also let the line units know that they wouldn't be getting new technology just because the technologists said so.

"It was important to get the buy-in from those units," Dodd says. "You've got to get them to say, 'Yes, we really want this to happen because it's good for us.' "

At the same time, the redesign staff had to keep a sharp eye on costs. "If we spend a dollar, we want to get a dollar's worth," Dodd says.

Electronic commerce does not loom large in the near future, but the Internet does have a role to play. In July, Qantas refurbished its year-old Web site, giving it a new look, offering more information on schedules and letting frequent fliers plan itineraries (with proper security measures) in the first of a series of planned improvements.

As the old goes out and the new comes in, Qantas has to make sure that everything continues to run as smoothly as it did before. "All those things," Dodd says, "depend on a stable network being in place."

Skillings is former Asia Pacific Bureau chief for the IDG News Service.

BETTING ON ATM

CANADIAN CASINO CLAIMS IT'S A WINNER

by DEANNE N. GAGE

To keep up with expected rapid growth in its gaming operations, Canada's Casino Windsor anted up in 1996 with Asynchronous Transfer Mode (ATM) technology.

The government-owned casino gambled that the multimedia networking technology could supplement an outgrown Token Ring/Ethernet assemblage by more effectively supporting the high bandwidth, continuous requirements of its business. The Windsor, Ontario-based casino wagered on an ATM backbone despite claims that the technology is still unproven and expensive.

ATM, with its integrated data, voice and video capabilities, is still considered bleeding edge in Canada; only 4% of companies use it. But the high-stakes gambit appears to have paid off.

"We saw it as leading-edge technology that could grow with the casino," says Mike Murphy, Casino Windsor's director of MIS, noting that the ATM network, provided by Digital Equipment of Canada Ltd., supports everything from gaming to business administration. "So far, it's been very reliable."

ATM is ideal for running the casino's bandwidth-intensive gaming applications. With slot machines, for ➤

How 3Com built a network

"Speed and scalability are critical to our business today, and to our plans to enter new markets across the country. 3Com understood this and delivered the ATM networking architecture our growth demanded at a price/performance point no other vendor could match."
–Dave Ellis, Director of Information Services, The Home Depot

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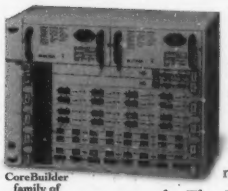
Solutions[3]

fast enough to keep up with The Home Depot.

When you're a $20 billion business with 25% annual growth driven by superior value and customer service, and your network is critical to your success, you tend to set high standards.



CoreBuilder family of switches

So when The Home Depot outgrew their information systems network, they chose to partner with 3Com, for superior technology and networking expertise.

The complete 3Com solution – featuring CoreBuilder™ and SuperStack® II switches – delivers price/performance no other vendor could match. Using their new 3Com network, The Home Depot is rapidly and reliably executing financial, inventory management, purchasing and point of sale programs, as well as e-mail, Microsoft Office, Lotus Notes, and a cache of client/server applications.

So, whatever the scale of your network, don't be afraid to have high expectations. For more information, contact your local 3Com office or visit us on the web at **www.3com.com/enterprise**

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The hybrid ATM network links various facets of the casino, including the main casino, three administrative buildings and a riverboat casino on the Detroit River.

example, gambling data is collected on a circuit card and then passed over the network to an AS/400 server for compilation, Murphy explains. Gamblers' signatures are even verified over the network, he adds.

The hybrid ATM network links various facets of the casino, including the main casino, three administrative buildings and a riverboat casino on the Detroit River, eliminating the need for wireless or satellite links.

"Currently, we're mainly using [the ATM] so we can communicate with each branch of the casino," Murphy explains, noting that he's hoping to provide intra-site communication in the future. "Can you get a [networked solution] for cheaper? Absolutely. But we like to compare it to buying a car. We bought a Cadillac: It's a very expensive solution, but it's also something we can grow into."

The casino's expected move into a new headquarters in Windsor early next year demonstrates why it needs a network that can grow as the company expands. The new facility, which will boast a 400-room hotel, will put even more systems on the network, including large multimedia applications that would provide Internet access and online room accounting.

"We also want to scan images and data and wave sounds over the ATM [to do video gambling]," Murphy says.

But gaming applications aren't the only data pulsating across the ATM network. Also attached to the network are business-critical systems: roughly 300 PCs connected to two AS/400s (which process all financial and gaming applications) across five sites; two Novell, Inc. servers; a SCO, Inc. machine; two RS/6000 machines; security; and computer output to laser disk. The network supports multiple protocols, including TCP/IP, IPX, IP, SNA and Data Link Control.

All this activity underscored Casino Windsor's need for high-speed transfer capabilities, says Dan Ford, president of Windsor, Ontario-based Applied Computer Solutions, Inc., which installed the network in February.

"The initial need was to connect multiple sites and do it with enough bandwidth to have real-time applications running video and possibly teleconferencing and imaging. So the traditional method of connecting sites, using routers and 56K bit/sec. lines, just wouldn't work," he explains.

Murphy offers the following advice for corporations looking at adopting an ATM network: "Make sure you have a strong service provider who understands networking."

Gage is a senior writer at Network World Canada, a Toronto-based affiliate of International Data Group.

NET WORTH

GLOBAL BANK PUTS STOCK IN FRAME RELAY

by JON SKILLINGS

The Hongkong and Shanghai Banking Corp. (HSBC) sends packets over its network the way the imperial Romans dispatched chariots along their fabled system of roads, bringing together the benefits of a central administration and the advantages of a local presence in far-flung climes.

"One of the strengths of having an integrated telecommunications network of global size is that you can move systems and you can move corporate philosophy very rapidly from one part of the world to another," says Tim Cureton, the bank's head of group telecommunications.

That means HSBC has been able to place functional groups where there is expertise — so treasury and legal are in London, mainframe development in Vancouver. And the bank could, if necessary, move a data center from Tokyo to Hong Kong or a computer center from Oman to Dubai.

That flexibility is important for an organization that, along with subsidiaries such as Midland Bank in Europe and Marine Midland Bank in the U.S., has more than 600 offices in 32 countries — and is still growing. Of its $1 billion information systems budget for 1996, more than $100 million was spent on networking.

"Once we have a beachhead somewhere, customers have to have access to everything we have — every system," Cureton says. From their desks, employees must be able to access any server — provided, of course, they have permission. For instance, all dealers in treasury services — money markets, derivatives, foreign exchange — use the same front-end system. That allows HSBC to "do more for less," Cureton says. "While IT budgets across the banking industry tend to be 22% of overhead, at HSBC, the IT budget is 15% of overhead."

HSBC is in the first stages of a six-year move from a mixed router and packet-switching network to one built around frame relay, a technology that Cureton says can be used for almost everything from SNA (generated by a bevy of AS/400s) to LAN and voice traffic. In a year or two, the bank may base the core of the frame-relay network on Asynchronous Transfer Mode (ATM), but for now, ATM remains "a bit of a campus LAN toy," he says.

"The strategy is, there shall only be one network," both geographically — "whether it is the Timbuktu office or the Tulsa, Okla., office" — and vertically, for handling voice, data, videoconferencing and so forth, Cureton says. "We haven't achieved that ideal yet," he adds.

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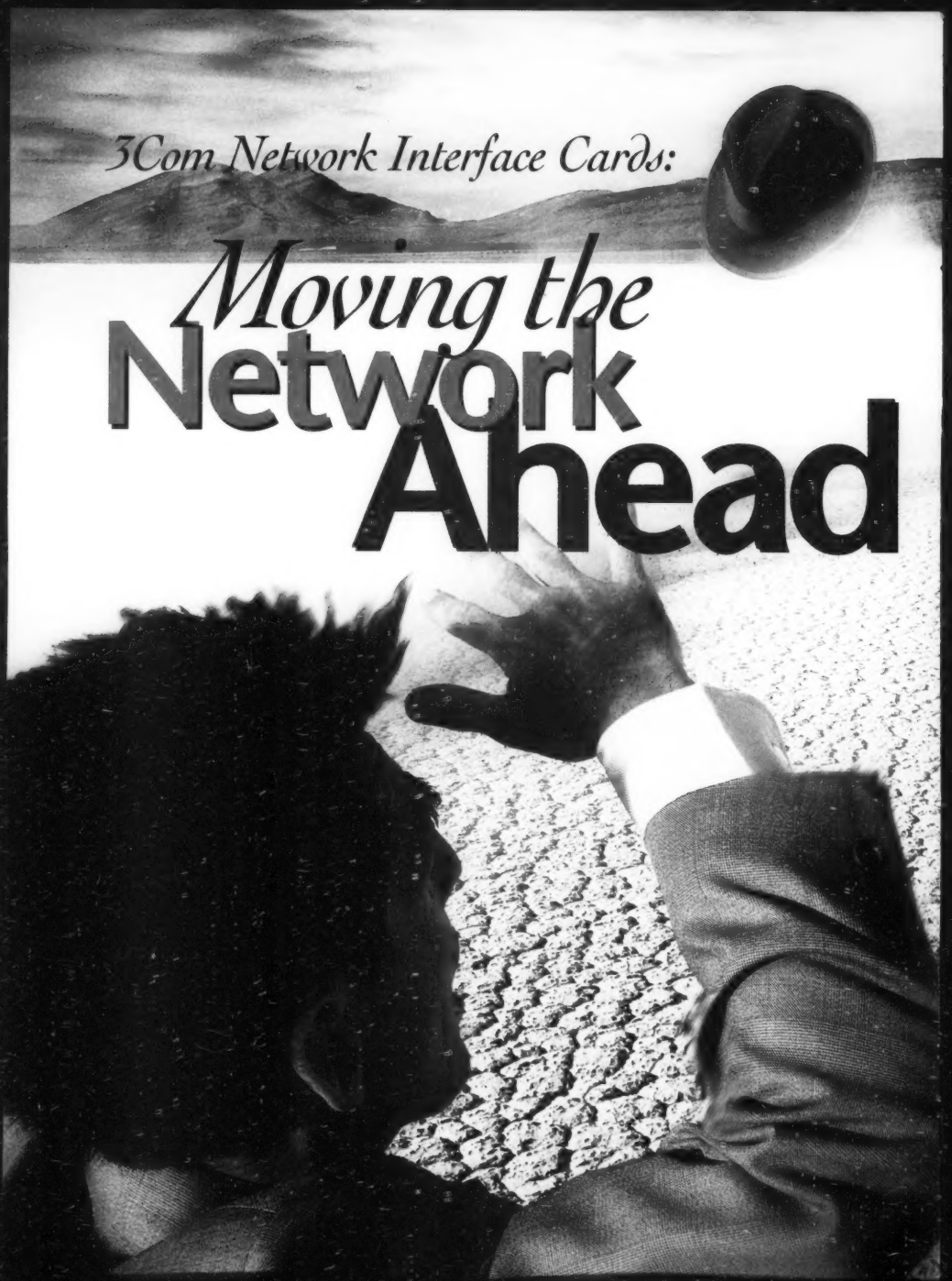
Skillings is former Asia Pacific Bureau chief for the IDG News Service.

PHOTO: ADRIAN BRADSHAW/SABA

TIM CURETON

One of the strengths of an integrated telecom network is "you can move systems and you can move corporate philosophy very rapidly from one part of the world to another."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Ahead

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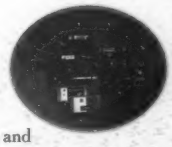

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GLOBALLY SPEAKING

U.S./CANADA

Carrier connections

by TOM NOLLE

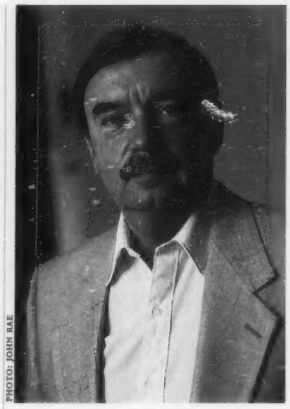


PHOTO: JOHN RAE

For all the hype of networking change wrought by deregulation and industry reform, a network manager from the early 1980s would be pretty comfortable with most of the carrier services and equipment options offered today. Nine out of every 10 wide-area networking dollars is still spent on traditional phone and leased-line services. But things change, and for carrier services in North America, big changes are in the wind.

In the next 25 years, networking will move from a leased-line-dominated set of practices to an almost complete dependency on carrier value-added services. Plain old T1 and digital transport will give way to frame relay, Asynchronous Transfer Mode (ATM) and IP connections.

Managed services that provide buyers with guaranteed bandwidth, delay, packet loss and maintenance response time will augment and eventually replace much of the internal network support process. These service trends will link the business users of networks more directly to network service providers. Is this good for those of us in the field? It doesn't really matter because it's inevitable.

The future is starting on our desks. It's clear that IP will play a major role in the "new" networks. Desktops today consume LAN protocols, and it's clear that IP is going to dominate premises networking and application development. The growth of the Internet is a visible indication of the value of IP, but it's the corporate commitment to IP and the large corporate budgets to support that commitment that will reshape carrier services in the IP space.

Virtual private data networks with guaranteed performance levels will be built on IP over the next decade, and by the year 2015 this type of network service will dominate data transport. While we don't believe IP will ever replace voice telephony, IP will garner the portion of voice communications that's associated with multimedia collaboration, and that may be the fastest-growing niche of the voice market.

At present, carriers are trying to break into new business applications because current telephone technology isn't proving cost-effective. Multimedia is neat, though workers won't be using it all the time. Today's networks can't recover bandwidth targeted at supporting multimedia collaboration when the workers are off eating lunch or producing goods.

Frame and cell networks — the value-added network technologies of the last few years — are far better at recovering wasted bandwidth and thus better at containing bandwidth cost. To fill the new demand niches, we'll see carriers shifting increasingly to switched services for frame relay, ATM and connectionless services such as IP.

High Price to Pay

Why hasn't this shift already happened? In the U.S. market, it's because of network access costs — the local loop.

Traditionally, users have paid 30% to 40% of their telecommunications dollars for about four miles of local access connection. Competition arising out of the Telecom Reform Act of 1996 will certainly drive local access prices down and at the same time create a new set of services such as those based on the various digital subscriber loop standards.

The biggest improvements in price,

in fact, will probably come on copper-based services at T1 rates and lower, making the local access bandwidth bonanza more a branch office and home office plus than one targeted at headquarters. That will reverse a long-standing trend of anemic support to the network's edge, where most customer contact really occurs.

To the North

The Canadian market's demand issues are much like those of the U.S. market, but carrier conditions are quite different.

In Canada, long-distance bandwidth is very expensive, and governmental policies on telecom reflect the need to provide basic telephony services to a population thinly spread across a giant geography. Frame relay's popularity in Canada suggests that value-added services such as frame relay or ATM will be deployed to conserve this expensive bandwidth and lower data communications costs to businesses. Given the high cost of traditional leased lines in Canada, it is very likely that Canadian telecommunications will move faster to a frame/cell basis than its U.S. counterpart.

There are a lot of forces acting on our networks, and that means future networks aren't going to be all ATM or all IP or all anything else.

It's exciting to think that a new technology concept such as ATM could sweep everything out of the LAN and WAN and give us a uniform architecture to face the future with. But it also ignores the different business pressures that apply to LANs and WANs, and without basic agreement on issues, it would be purely a coincidence if we achieved agreement on technology.

For the next 25 years, our choices and problems in networking will be more complex than ever, and that's the truth.

Nolle is president of Cimi Corp., a Voorhees, N.J., network consultancy.

EUROPE

Wide priorities

by JOHN MATTHEWS

PHOTO: P. JORDAN/NETWORK/SABA

As more employees work at home at least part of the time, as offices increasingly require more rapid information exchange, European network managers — like many of their counterparts around the world — are making wide-area networking their top priority for the near term.

Network managers who want to implement or manage a successful WAN in Europe will find that a bewildering array of technologies, compatibility issues and high prices awaits them. The liberalization of the European telecom market may eventually change things — its implementation date is less than six months away, though various countries have already obtained extensions. But in the interim, take note of this confluence on the Continent:

Compatibility

If travelers across Europe have problems attempting to plug their PCs into the local phone sockets, the network manager must contend with the different wide-area services, equipment and interfaces of different countries. Despite the introduction of a "single market" in 1992, even the countries of the European Union (EU) are still more than a dozen individual markets as far as telecommunications is concerned. There is even greater diversity in the countries outside the EU and in the former Warsaw Pact countries.

Price

The broadband network capacity required for European networks doesn't come cheap. A 34M bit/sec. circuit in Europe can cost up to three times the price of a similar circuit from Nynex Corp. The situation is even worse when the circuit crosses a national boundary. Users hope competition will bring these prices down; in the U.K., long-distance call prices have fallen by about 60% since full competition started in 1992.

Technology choice

National preferences and the interests of the incumbent telco largely influence the technology used, and there are a number of options. European companies expect to spend less on X.25 and leased circuits as these technologies are replaced by such technologies as the following:

■ Asynchronous Transfer Mode (ATM). To support broadband in the WAN, many of the big European telcos have introduced ATM in their backbones and launched ATM services to end users, but these are priced at a premium (except in Finland) and ➤

are not actively marketed. However, ATM continues to be regarded as the long-term networking solution to support voice, data and multimedia on the same network.

■ Frame relay. Though some of the major telcos in Europe have attempted to push Switched Multimegabit Data Service (SMDS), this has not been universal, and users have voted with their pocketbooks for frame relay, which is more cost-effective. As a result, frame-relay usage has grown rapidly recently — 80% last year.

■ ISDN. Integrated Services Digital Network (ISDN) has finally (after nearly a decade) begun to take off in the past 18 months, driven largely by very attractive marketing and pricing in Germany. Monthly rental of an ISDN line is now $29 there, compared with $32 for two analog lines.

One point of all these technologies is giving remote access to workers at home. The vast majority of home workers use a modem on the public switched telephone network, but this is becoming painfully slow for the fastest-growing applications: multimedia electronic mail and browsing the Web. ISDN improves things slightly, and European telcos are testing many of the solutions being proposed from North America: Asymmetric Digital Subscriber Line (ADSL) cable modems and increased use of fiber in the local network.

User demands are becoming increasingly sophisticated, and applications seem to require more bandwidth by the day. It's all a network manager can do to keep up, and all we can do to be patient.

Matthews is an analyst specializing in voice and data networking at Ovum Ltd. in London.

ASIA

Growing strong

by GIGI WANG

Asia is often compared to Europe because it is a continent of diverse nations. But unlike Europe, Asia has a pronounced disparity among countries in terms of gross domestic product (GDP), information technology spending and technology adoption. Another distinction: Asia is economically dominated by a single country — Japan.

Japan's GDP is more than half that for the entire continent: $4.48 trillion, of a total $7.9 trillion. International Data Corp. (IDC) research shows that Japan accounts for approximately 75% of IT spending — some $85.1 billion — and 50% of all PC shipments there. Consequently, technologies dependent on PC proliferation, such as LAN usage, are also dominated by Japan.

Yet economic forces show changes are in the works. Korea follows Japan as the Asian nation that spends the most on IT as a percent of GDP: $5.8 billion in 1996. But China, with $5.53 billion spent last year, is fast closing in, and IDC predicts it will overtake Korea by the end of the decade.

PHOTO: JOHN SOARES

Network spending will be part of this boon as multinational corporations look to maintain networking standards around the world and resolve the problems with their networks in parts of Asia. Many of these problems are due largely to the variation in wide-area data services and the relative inexperience of users in installing and managing newer networking technologies.

Overall enterprise network technologies used throughout Asia, from hubs to switches, are the same as those used in the U.S., though local vendors are often more popular than U.S. brands due to price. The major challenge for building networks in Asia is not technology adoption but getting consistent wide-area data services from the carriers in each of the Asian countries, as services such as frame relay aren't available uniformly.

Asynchronous Transfer Mode (ATM), however, is expected to grow rapidly in the next five years as equipment prices decline rapidly and governments and vendors mount a strong push for its use. In Korea, for example, a large market and high user demand for high-speed, sophisticated networks will likely fuel ATM growth. In Malaysia, the government is pushing ATM for its Multimedia Super Corridor project, a plan to build a networked "cybercity" with private and public money.

The challenge for ATM deployment, of course, will be the relative lack of ATM technical skills, as well as the ubiquitous high management costs. And even if ATM is available, companies won't necessarily start using it.

Users in Asia, like users everywhere, are waiting for applications that will justify ATM usage. An upgraded infrastructure alone doesn't drive usage. Look at Singapore, where a new fiber-optic phone network with state-of-the-art equipment has not significantly increased ATM usage.

Wang is a senior vice president at International Data Corp.

LATIN AMERICA

Internet opportunity

by CLAY RYDER

The Internet is pretty much a given for those in English-speaking countries with deregulated telecommunications infrastructures. That's not the case in Latin America yet.

If there's a common thread of Internet use around the world, it is that the acceptance and growth of the Internet/intranet is highly dependent on a country's particular political and societal goals rather than whether fiber-optic cable is connected to every home or office. This holds especially true in Latin America, where the potential is unarguably high, but significant political issues that transcend technology will ultimately dictate the pace of Internet deployment and hence its market opportunity.

Because of the unfettered communications potential of the Internet, for instance, many governments south of the lower 48 will likely stymie its proliferation. Much of Latin America remains threatened by political repression and socialism, and the threat of more control over communications is very real. This resistance may come in many forms, including fiat, laws, regulated pricing, equipment costs, equipment certification and supplier vetting. These means may limit the Internet connection potential of the population, causing slower growth than in North America.

Yet Latin America's low to moderate level of Internet activity does appear to be on the rise (see related story page 17). And its potential is driving the development of the wireless communications

PHOTO: CINDY CHARLES

markets. As in other areas of the world where the land-based infrastructures are limited, wireless solutions — if allowed to be competitive and detached from the government or government-controlled Postal Telephone and Telegraph authorities — could provide a significant market opportunity. Satellite-based networks, for instance, represent new connectivity potential for businesses.

Stable Infrastructure

The network infrastructure itself is stabilized in all major countries and markets in the region. Argentina, Chile and Brazil have achieved the highest degree of political and financial stability. Argentina and Brazil boast the largest number of Internet service providers (ISP), and Brazil claims the largest number of seats, domains and ISPs. Historically, Brazil's is a difficult information technology market, but it is becoming less so with reduction in tariffs.

Argentina and Chile have privatized much of their telecom infrastructure and are seeing investments by major European and North American telecommunications companies.

Peru seems ready to move into the same category as Argentina or Chile, with one exception — the Peruvian government is limiting political and personal freedom for the sake of quelling the historical rebel group Shining Path.

Chile and Mexico, in contrast, are slightly less regulated, with the Chilean market emerging in part due to its newly opened telecom market. However, political factors linger, which may prove troublesome as more users get connected.

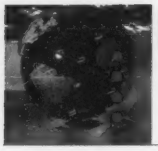
Mexico's telecom market is still in the process of opening. However, increased influence from major telecom players such as Concert (a BT/MCI Communications Corp. joint venture) look to stimulate growth. The passage of the North American Free Trade Agreement and the increased number of maquiladoras — U.S.-oriented manufacturing plants a stone's throw across the border — represent a growing opportunity for transnational communications.

But despite their broad-based marketing, these services appear to be driven by transnational corporations for U.S./maquiladoras communications, as opposed to broader consumer use in Mexico.

Meanwhile, Costa Rica appears to be the least regulated area. But there is considerable North American influence, and a good technical infrastructure is in place. Costa Rica's relatively lax regulations are indicative of its higher Internet connectivity potential.

In all, telecom deregulation, the social/political climate and the potential proliferation of wireless networks will dictate the pace and direction of Internet growth in Latin America. The potential is high, but growth will be shaped by those many factors.

Ryder is chief analyst at Zona Research, Inc., a Redwood City, Calif.-based consultancy that recently examined the number of Internet-capable seats, registered domains and ISPs in Latin America. He can be reached at cryder@zona research.com.



The Network 25

COMPANY, LOCATION, WEB SITE ADDRESS	IS BUDGET	NETWORK BUDGET	AUDIENCE FOR WEB SITE: INSIDE OR OUTSIDE COUNTRY
Argentine Beverages Division; Argentina (no Web site)	$4.3M	$1.3M	Not applicable
Argonne National Laboratory; U.S. www.anl.gov	$18M	$11M	Inside
Atraxis AG; Switzerland www.atraxis.com	$135M	$35M	Inside
Banco Bradesco SA; Brazil www.bradesco.com	$383.4M	$61M	Inside
Benetton SpA; Italy www.benetton.com	$14M	$3.5M	Outside
British Petroleum; U.K. www.bp.com	$500M	$90M	Outside: U.S., Europe, Australia
Casino Windsor; Canada www.windsornights.com	NA	NA	Outside: U.S.
Cemex SA de CV; Mexico www.cemex.com	$40M	$25M	Outside: 37 countries
Companhia Vale do Rio Doce; Brazil www.cvrd.com.br	$17.8M	$17.5M	Outside: U.S., Canada, Europe, Japan
CSX Corp; U.S. www.csx.com	$500M	$170M	Both; Canada, Mexico, Brazil, Germany
The Equitable Companies, Inc.; U.S. www.equitable.com	$96M	$31M	Inside
First National Bank of Southern Africa www.fnb.co.za	$134.8M	$22M	Inside
Florida Power and Light Co.; U.S. www.fpl.com	$157M	$27.6M	Inside
Hongkong and Shanghai Banking Corp. www.hsbcgroup.com	$1B	$140M	Outside: 90 countries
Merita Bank; Finland www.merita.fi	$100M	$15M	Inside
National University of Singapore www.nus.sg	$9M	$2M	Inside
Petrobras SA; Brazil www.petrobras.com.br	$275.7M	$131.6M	Inside
The Progressive Corp; U.S. www.auto-insurance.com	$96.6M	$16M	Inside
Qantas Airways Ltd.; Australia www.qantas.com	$220M	$75M	Outside: U.S., France, U.K., Germany
Samsung Electronics Co.; Korea www.samsungelectronics.com	$3.75B	$1.3B	Inside
Skoda Automobilova A.S.; Czechoslovakia www.skoda-auto.cz	$18.6M	$4.7M	Inside
SmithKline Beecham PLC.; U.K. www.sb.com	$600M	$75M	Both; 135 other countries
Start Informatik GmbH; Germany www.start.de	$100M	$50M	Inside
Stockholm Health Care Authority; Sweden (no Web site)	$3M	$2M	Not applicable
The Times of India Group; India www.timesofindia.com	$10M	$4M	Outside: U.S., Europe

ALL BUDGET FIGURES ARE FOR 1996

AN INTERNATIONAL COMPENDIUM OF NETWORK-SAVVY ORGANIZATIONS

NETWORK STAFF	TOP 2 SPENDING PRIORITIES IN '96 (AND PERCENT OF BUDGET SPENT ON THEM)	FOR INTERNET USE:			
		UPGRADED SERVERS	UPGRADED NETWORK PLUMBING	MIGRATED TO TCP/IP	EMBRACED FAST ETHERNET, ATM
15	LANs (45%), WANs (30%)	★	★		
40	LANs (34%), switching (28%)	★	★		
61	WANs (72%), voice (14%)	★	★	★	
139	WANs (65%), LANs (12%)	★	★		
10	Global networking (40%), LANs (30%)			★	★
20*	Voice (60%), LANs and WANs (10% each)	★	★	★	★
3	Network management (70%), LANs (15%)	★			
43	Internet/intranet (20%), LANs, WANs (15% each)				
105	LANs (37%), network management (20%)	★	★	★	★
350	WANs (26%), LANs (16%)	★	★	★	★
85	LANs (39%), WANs (25%)	★	★	★	★
129	LANs (40%), WANs (26%)				
164	LANs (23%), network management (23%)				
450	WANs (50%), voice (30%)				
30	WANs (65%), LANs (15%)	★		★	
10	LANs (28%), switching (18%)	★	★	★	★
756	WANs and global networking (65%), LANs (9%)	★	★	★	★
110	Network management (35%), switching (28%)	★	★	★	
50	WANs (35%), LANs (30%)	★	★		
83	Internet/intranet (47%), other (16%)		★	★	★
45	Switching (24%), Internet/intranet (19%)		★	★	
160	LANs (13%), WANs (12%)	★	★	★	★
40	WANs (90%), network management (5%)				
15	LANs (30%), Internet/intranet (30%)	★	★		
50	WANs (50%), LANs (20%)		★		

*PLUS OUTSOURCERS

NO CATEGORIES MARKED MEANS "OTHER" NETWORK IMPACTS EXPERIENCED

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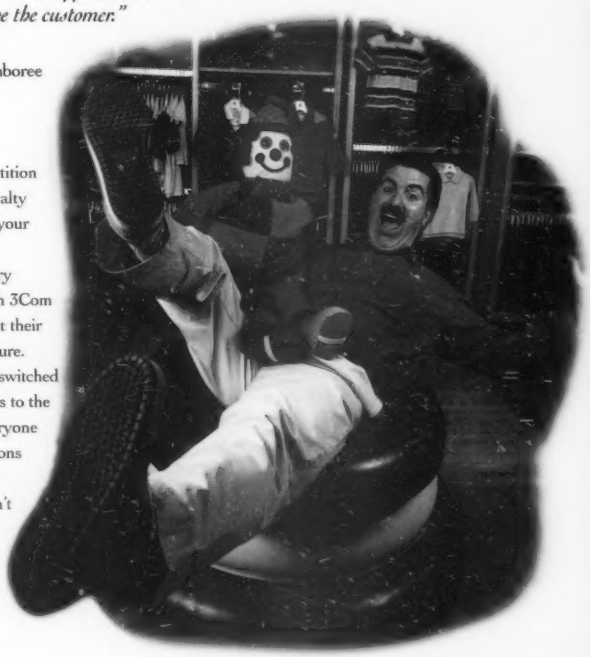
Solutions[3]

The Intelligent Store:

The POS Network *you can't* Outgrow

"With 3Com's networked POS solution, we cut credit authorization times by half. Our new networked applications allow our store associates to better serve the customer."

— Robert Notte,
Director, IS Operations, Gymboree



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From the 3Com POS access concentrator and switched Ethernet workgroups at Gymboree headquarters to the more than 400 Ethernet in-store networks, everyone gets the access they need. Networked applications let store associates offer better service, and fast credit authorization ensures that customers don't wait in line for too long.

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500728-001 9/97

Feds launch another Intel probe

By April Jacobs

INTEL CORP. last week experienced a bad case of deja vu. The Federal Trade Commission is investigating the No. 1 chip maker's business practices in what Intel is calling a "broad and extensive manner."

The FTC declined to confirm or deny the probe. But Chuck Malloy, a spokesman for Intel in Santa Clara, Calif., said the investigation began Wednesday with a request by the FTC for detailed information ranging from current and past business transactions to future technology plans.

The agency doesn't make investigations public, but a spokeswoman said the FTC would be forthcoming if it decides to pursue any legal action against Intel. Such action could result in a consent agreement or a lawsuit.

Malloy said the investigation has many parallels to one that took place between 1991 and 1993. In that case, the FTC chose to drop the matter. The genesis of that investigation also is unclear.

Intel says the FTC probe has many parallels to one that took place between 1991 and 1993.

Observers said Intel, which makes about 85% of chips sold today, may have attracted attention because of its high market share or because of unhappy competitors.

Intel also is under scrutiny by the FTC for its announcement several months ago that it plans to acquire Chips and Technologies, Inc.

Malloy said the company has the same program in place it did in 1991 to make sure it complies with FTC regulations regarding antitrust matters.

Joe Sims, an antitrust partner at Jones Day Reavis & Pogue, a law firm in Washington, said it is impossible to tell whether the investigation is a serious matter or not. Moreover, he said, the investigation could take years or months to complete. □

Mellon banks on best practices project

By Thomas Hoffman

ALTHOUGH MANY banks are leaning on third-party application packages to manage their financial services, Mellon Bank Corp. is upping its investment in homegrown development efforts to bring new products to market.

Mellon's Allan P. Woods: World-class performance will improve productivity

Mellon, in Pittsburgh, has created a software engineering unit that will incorporate "best practices" into its application development methods.

The approach is a calculated effort by Mellon to use the best tactics for creating new applications and managing the people who create them — whether invented in-house or by another party.

"We believe that by achieving world-class performance, we'll get to the more strategic issues of time-to-market and productivity," said Allan P. Woods, executive vice president at Mellon Information Services.

Unlike other commercial banks, which derive most of their revenue from interest-bearing accounts, Mellon generates 60% of its revenue from fee-based businesses, such as cash management and personal asset management services offered by its Dreyfus fund unit.

Overall, Mellon manages approximately $1.6 trillion in assets. Mellon also stands apart from most other banks by developing most of its applications in-house.

The trend in the industry has been to implement third-party packaged solutions because of the dual challenges of staying abreast of new technologies and retaining top-flight programmers, said Bill Burnham, an analyst at Piper Jaffray, Inc., an investment bank in Minneapolis.

Mellon's Kevin L. Shearan: "A professional environment attracts the best people"

Mellon officials said they hope to leverage their success with the unit to recruit the best and brightest.

"I strongly believe that building a professional environment attracts the best people and achieves the best results," said Kevin L. Shearan, who was tapped by Mellon to lead the unit.

Shearan, 43, a 17-year veteran at Citicorp, will be responsible for six application development groups and more than 1,000 programmers at Mellon. He was previously technological director for global securities at Citicorp in New York.

Woods declined to disclose Mellon's financial commitment to the effort. The bank now spends about $370 million per year on information technology.

To help Shearan implement best practices for the group, Mellon hired consultant Electronic Data Systems Corp. So far, EDS has found that Mellon is top-notch with the way it manages products, but the bank needs to improve its software development project management, Woods said.

In response, Mellon plans to apply some processes created by Carnegie Mellon University's Software Engineering Institute in Pittsburgh to measure progress on application development projects, Woods said. □

Publishers plan global system for 'net documents

By Kim S. Nash

A GROUP OF publishers next month will formally announce a global directory and numbering system for documents and images published on the Internet.

The aim is to help users more easily find information, such as reports and scholarly journal articles, and verify the pedigree of online information.

The electronic numbering system, to be announced Oct. 15 by the Association of American Publishers, Inc. (AAP), also could be used by companies to catalog information on internal servers.

Houghton Mifflin Co., John Wiley & Sons, Inc. and seven other publishers are testing the AAP system and have created more than 250,000 DOIs

In essence, the Washington-based AAP wants to build a giant directory system that would integrate pointers to data around the world. But Novell, Inc. and Microsoft Corp. have long had trouble building much smaller directories for electronic-mail systems.

Carol Risher, vice president of copyright and new technology at AAP, acknowledged that the group faces some technical challenges building the directory.

BROKEN LINKS

Risher said she hopes the system will avoid the problems of existing search engines. They often yield broken links and errors because they point to servers where the information last resided, not to the information itself. The AAP plan includes the following:

- Publishers would pay $1,000 for a unique numerical prefix for their online material.
- Each piece of information would have the prefix plus its own number. The combination is called a Digital Object Identifier (DOI).
- Companies that abstract articles, for example, would display a DOI. Users could click on the DOI to be linked directly to the material, no matter where it is stored.

Publishers also could use the system for copyright protection or to charge a fee for downloading articles. □

Leaders. Visionaries. Master politicians.

Michelin North America's Lynn Melvin seeks those kinds of professionals for her new electronic-commerce team. Many other companies, such as Federated Mutual Insurance and Chevy Chase Bank, need IS people with business-savvy skills to drive their organizations. IT Careers, page 90

LYNN SILER

Three companies are scouring colleges and high schools to help find potential talent such as Loc Khau, Managing, page 70

Software viruses explode, spread by E-mail and the popularity of Word macros. Software, page 59

56K bit/sec. modems give you a boost, but it may not be enough of an edge to make you want to go out and buy one. Buyer's Guide, page 77

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Oracle maps out plans for Java tools

By Craig Stedman
Los Angeles

ORACLE CORP. last week delivered on a promise to detail plans for a three-tier set of Java development tools that will be intertwined with its proprietary programming products.

But delivering most of the technology will still take time.

A Java client tool with hooks to Oracle databases is due in the fourth quarter. Scheduled to follow next year is support for writing Java-based business objects and storing them in the design repository used by Oracle's mainstay Developer/2000 and Designer/2000 tools.

The ability to reuse objects with any of the tools also is part of the master plan, but Oracle officials said that won't come until 1999 (see chart).

JAVA TOOLS NOW

Users at the Oracle OpenWorld '97 conference here said they want to get at the Java tools to reduce their dependency on Oracle's proprietary PL/SQL language — and the high salaries they have to pay to programmers who know it.

"We're pushing Oracle to get the integration [between Java and its existing tools] done in a hurry," said Brad Jones, director of infrastructure at Franklin Covey Co. in Salt Lake City. The company, which sells time-management products, is installing Oracle applications that will include Java-enabled network computers for some users.

Jones said he hopes Java will help Franklin Covey cut development times in half on some applications.

Experienced PL/SQL programmers can fetch salaries of $60,000 to $80,000 in the Salt Lake City area, he said. "But we could go hire somebody who knows Java for $45,000."

Competition for Oracle developers is "unreal," said Rich Niemiec, a Lombard, Ill., consultant and executive vice president of the database-oriented International Oracle Users Group — Americas in Chicago.

"There's not too many people who know PL/SQL or who want to learn that now," Niemiec said. "But when you start bringing in Java, you bring in this whole wave of developers that haven't been in the Oracle world before. That will push down costs."

The Java strategy, which replaces the Sedona object development technology that Oracle abandoned last month, also should help make the company's much-hyped multitier computing scheme a more realistic option for users, said Mitch Kramer, an analyst at Patricia Seybold Group in Boston.

RUNNING LATE

But the switch from Sedona to Java has put Oracle six to nine months behind schedule on delivering object-friendly tools for building applications that hew to its Network Computing Architecture (NCA), Kramer added. "NCA is an interesting vision, but it's not all there yet."

Oracle tried to mutate Developer/2000 into a three-tier tool this year by adding support for converting fat-client Windows applications to server-based programs for users with World Wide Web browsers.

Developer/2000 and Designer/2000 are expected to remain Oracle's flagship tools, said Steve Illingworth, a senior product marketing manager at the Redwood Shores, Calif., company. "But we can't ignore what the Java world is doing." □

POURING JAVA

Oracle's Java Integrated Development Environment rollout:

Q4 1997

- Java client tool based on Borland's JBuilder

Mid-1998

- Java development support for application servers
- Common design repository for all Oracle development tools

Second half of 1998

- Support for writing database functions in Java

1999

- Ability to reuse objects across all Oracle tools

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Bank deal poses culture clash

▸ *Travelers Group buys Salomon, Inc. for $9B*

By Thomas Hoffman

THE TRAVELERS GROUP'S $9 billion acquisition of Salomon, Inc. is expected to create a global investment banking powerhouse that should put it on equal footing with giants such as Merrill Lynch & Co. and Goldman, Sachs & Co.

But with two distinctly different cultures, executives at the combined entity could have a tough time melding the respective information systems staffs and choosing best-of-breed systems without bruising egos and alienating staffers who will be sorely needed to make the merger succeed.

INVESTMENT BANKING

On Wall Street, "there are a lot of big egos and lively personalities. People problems are often bigger than technical problems," said Bill Burnham, an analyst at Piper Jaffray, Inc., a Minneapolis-based investment bank.

While insiders were buzzing that the marriage could lead to as many as 2,000 layoffs, most analysts said the two companies will be anxious to keep as many technologists as possible — at least in the short term — to ensure that the merger goes smoothly.

"It'll be a field day for recruiters," Burnham said.

After the systems integration is completed, analysts said, they expect some downsizing of the combined IS staff, especially after data centers and network infrastructures are cobbled together.

Analysts said Salomon is a "rough-and-tumble crowd" that takes risks and is "very independent-minded." Conversely, Travelers' Smith Barney unit "doesn't have the same gang-busters mentality," said Bob Becker, a securities analyst at Argus Research Corp. in New York.

In a proprietary trading floor environment such as Salomon's, the IS staff works hand in glove with traders "because IS is integral to monitoring and executing that trading," Burnham said. Travelers' management might be best-served by letting Salomon continue to run its trading operations its own way, he said.

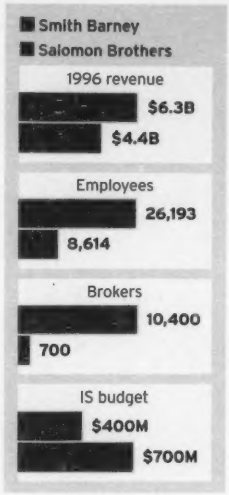
"That's how they make a lot of money," Burnham said. "If you don't give them a lot of latitude, you risk rocking the boat."

Executives at Travelers and Salomon couldn't be reached for comment. A secretary for Travelers Chief Information Officer Richard Morrison said he was on vacation. A spokesman for New York-based Travelers said the company is "several weeks away from making any preliminary decisions about any aspects relating to technology."

But Travelers executives said the company plans to take an after-tax charge of $400 million to $500 million to cover systems consolidations, severance and other costs.

What is clear so far is that the two investment banks' operations are more complementary than overlapping. Salomon's strengths are in bond and institutional trading. Smith Barney's forte is in retail transactions. Because of those differences, analysts said, the combined company may choose the most robust systems to support each of those businesses.

"Salomon's technology is geared toward institutional trading. That's not Smith Barney's raison d'etre," said Larry Tabb, a technology analyst at The Tower Group, a Newton, Mass.-based financial services and technology consultant.



ENOUGH POWER?

Tabb said he wasn't sure if Salomon's Unix-based retail trading platform has the horsepower to handle Smith Barney's massive retail trading volumes, which he said are processed with mainframes. Smith Barney has more than 10,000 brokers, compared with just 700 at Salomon.

Tabb said it will cost about $50 million to combine the companies' systems. In previous, similarly sized mergers, companies have reduced their information technology and telecommunications costs by 20% to 30%, said Octavio Marenzi, an analyst at Meridien Research, Inc. in Needham, Mass.

For Smith Barney and Salomon, those savings could potentially be worth hundreds of millions of dollars, he said. □

PC vendors' move to hybrid sales models gives users more options

▸ *Customers can opt for lower prices or more service*

By April Jacobs

RECENT MOVES by PC vendors to sell every which way but loose may be causing some market confusion, but the result for users will be cheaper PCs and servers, more buying options and better service, analysts said.

Analysts at Gartner Group, Inc. in Stamford, Conn., said the hybrid distribution model that all vendors but Dell Computer Corp. are pursuing — in which they sell directly and through the channel — will provide users with more choices. Those who need more handholding are likely to stick with channel support; the more self-reliant shops will opt for direct sales to take advantage of 10% to 15% price breaks.

"We wanted a bundled package, but the implementation and deployment is not something we wanted to take on internally."

– Alan F. Nugent, American Reinsurance

For example, Dell's out-of-the-box style is just fine for Montgomery Mutual Insurance Co. The Sandy Hill, Md.-based insurer installs its own software and gets all its PCs up and running itself.

"We have no problems with them at all. If we need them for service, they're there," said Debbie Kibiloski, a PC administrator at Montgomery, which has about 250 end users.

She said Montgomery likes dealing directly with a vendor because of the one-on-one relationship in the buying process and because the process is straightforward.

Still, even though vendors are radically altering their sales and distribution models, the rules for buying PCs and servers haven't changed, said Chris Goodhue, a Gartner analyst.

Goodhue said users should figure out what their requirements are for hardware and software, decide how much of the work they can do themselves and then match their needs to the appropriate vendor or channel provider.

But a systems integrator or vendor with extensive service experience can still be the best choice for companies that need more assistance.

At American Reinsurance Co., for example, getting 1,500 desktops up and running in just under three months was made easier by going through a systems integrator.

"We wanted a bundled package, but the implementation and deployment is not something we wanted to take on internally," said Alan F. Nugent, chief information officer at the Princeton, N.J.-based insurer.

"This way, an army of people came in from Entex [Information Services] under our management and installed everything," Nugent said. He noted that although requests for proposals were sent out to direct vendors such as Round Rock, Texas-based Dell and indirect vendors such as Hewlett-Packard Co., the best fit was a third-party provider.

Prudential Insurance Company of America in Newark, N.J., is also seeking PC and server vendors with extensive service and support. Prudential has more than 50,000 desktops.

Vendors also are trying to compete on many levels for different types of customers:

- Gateway 2000, Inc. in North Sioux City, S.D., broke in to the corporate market two weeks ago with channel support for servers, desktops and portables, breaking away from its traditional direct model.
- Vendors, including Compaq Computer Corp. in Houston and HP in Palo Alto, Calif., have announced over the past few months build-to-order and configure-to-order programs designed to cut costs and add ordering flexibility for customers — something Dell has always employed.
- Compaq and Somers, N.Y.-based IBM have both announced within the past six months soup-to-nuts financing, integration and service branches to attract corporate customers. Compaq also doubled its street sales force with the acquisition of Tandem Computers, Inc. □

Corrections

Because of inaccurate information furnished to *Computerworld* by Meta Group, Inc., the story "Project management ills cost businesses plenty" [CW, Sept. 22] incorrectly attributed research about the cost of project cancellations and budget overruns to Meta Group. The research was conducted by The Standish Group International, Inc. in Dennis, Mass.

In the same issue, the scheduled deadline for completing year 2000 work at Toyota Motor Sales USA, Inc. is Jan. 1, 1999, not Jan. 1, 1998, as was reported in the story "Toyota revs up project management."

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FRANKLY SPEAKING

'net freebies not so crazy

FRANK HAYES

How crazy is the idea of giving away network computers the way cellular telephone companies give away free phones when customers sign up for service?

Not crazy at all, it turns out. And if Internet service providers buy in to Jim Barksdale's idea, corporate IS shops will never be the same again.

Barksdale gave away a lot of cellular phones when he was in charge at McCaw Cellular Communications. Now he's CEO at Netscape, and he's working with Netscape's business partners to set up similar giveaways that link free hardware with Internet services.

How serious is Barksdale? At the ninth annual Government Technology Conference this month in Albany, N.Y., he said giveaway trials will start within a year.

Barksdale wouldn't name names or spell out details, but you don't need those details to see the similarities between cellular phone providers and Internet service providers. In both businesses, competition is brutal, and profit margins are razor-thin.

But cellular providers use giveaway phones to attract customers — then lock them in for as long as three years. Internet service providers who want to survive the next few years could use an edge like that.

If providers give away hardware, more customers will show up.

Can service providers really afford to give away Internet hardware? Do the math. A typical giveaway cellular phone has a $300 price tag, and monthly cellular phone bills run as low as $30. If $20-per-month Internet service providers gave away $300 Internet appliances, peddled new services, sold advertising and cut support costs, yeah, they could match the economics of cellular phone giveaways. And a $300 Internet appliance is possible — after all, the cost of a WebTV starts at $199.

Maybe that doesn't sound as if it would change the face of IS forever. It would just bring a few more consumers to the Internet, right?

Wrong. It would make the Internet really matter.

You wouldn't know it from the clamor of the trade press and the mainstream media, but the Internet barely exists. There are plenty of Web sites — many of them from businesses. But only a tiny fraction of U.S. homes use the Web.

A mere 9% of U.S. households are connected to the Internet, according to Nielsen Media Research. And some of them use the 'net only for electronic mail.

From a marketer's viewpoint, it's as if someone built the world's biggest shopping mall and nobody came. Until more customers show up — a lot more customers — the Web is a joke.

But if Internet service providers start giving away easy-to-use hardware, a lot more customers *will* show up — people with no love of computers but plenty of money to spend.

That will put IS directly on the front lines in the biggest selling opportunity since, well, shopping malls.

When that happens, get ready for a murderous struggle between your IS shop and marketing department over who will control your organization's Web sites.

You'll struggle to build consumer-quality applications for the Web, too. "Consumer quality" means simple to use, bulletproof and effective in selling your company's products and services — in other words, a quantum leap in quality beyond what you've done for internal users in the past.

Your server management will have to be superb, your links to legacy ordering systems perfect, your ability to react to a sudden huge increase in users flawless.

In other words, all those free Internet devices will raise the bar far above what you've ever had to achieve before. It's not impossible, but it won't be easy. And IS will never be the same.

So, you'd better start planning for those changes — unless you think reaching that kind of perfection will be easy.

Now *that's* a crazy idea. □

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORTS

Year 2000 laggards

A startling 30% of companies worldwide haven't begun to address the year 2000 programming problem, according to a Gartner Group, Inc. study. The poll included 2,300 companies, institutions and government agencies in 17 countries. Industries that lead the pack in year 2000 work include financial services companies and most types of manufacturers. At the bottom of the heap are health care providers.

Oracle7 winds down

With its focus now on Oracle8, Oracle Corp. plans to wrap up the scheduled development of its Oracle7 database after delivering one last bug-fix update next month. After Oracle7.3.4 is finished, Oracle will fix only those bugs that cause "business-stopping kinds of problems" for users.

Oracle8 to push data

The onslaught of product announcements at Oracle OpenWorld '97 in Los Angeles last week included a deal for Oracle to embed in Oracle8 publish-and-subscribe messaging software from Palo Alto, Calif.-based Tibco Software, Inc. in Oracle8. That will give the database the ability to push information out to end users who have asked to be notified when data changes or business events occur. The software will be built in to Oracle8.1, which is expected to materialize in the second half of next year.

Billing over the 'net

MSFDC, a joint venture of Microsoft Corp. and First Data Corp., plans in the first quarter of next year to roll out a service designed to allow companies to present bills to customers over the Internet. Right now, several banks let users pay bills across the Internet, but bills must be presented by other means.

Kerrey calls for Y2K review

U.S. Sen. Bob Kerrey (D-Neb.) has introduced a bill that calls for several federal agencies to study the year 2000 problem. The measure would instruct the Federal Communications Commission to study potential problems for telecommunications networks; the National Institute of Standards and Technology to review risks to PCs; and the Department of Transportation to look at safety issues for devices such as traffic lights.

Air base users balk at NT

Information technology personnel at the U.S. Air Force's Air Mobility Command headquarters at Scott Air Force Base, Ill., have filed a complaint over plans to make Microsoft's Windows NT and Exchange standard throughout the service. In a letter to the Air Force inspector general, they charged that no proper technical evaluation was conducted and no one adequately considered the financial impact on centers such as theirs, where more than half the users now run Novell, Inc.'s GroupWise.

Quarterdeck eases downloading

Quarterdeck Corp. will introduce two programs to address bandwidth issues for users who download zipped, or compressed, archives over the Internet. I-Zip, when used with Quarterdeck's new Zip-It 4.0 client, lets users view or download files before downloading the entire contents of a zip archive. Quarterdeck, in Marina del Ray, Calif., will make I-Zip Server available to qualified sites within the next month.

Lotus to give away mail client

Lotus Development Corp. in Cambridge, Mass., will give Lotus Mail, an Internet mail client, to users who purchase its SmartSuite 97 productivity suite beginning in October. Lotus Mail supports Post Office Protocol 3, Simple Mail Transfer Protocol, Multipurpose Internet Mail Extension and Lightweight Directory Access Protocol standards. It normally costs about $49.

Novell offers distributed printing

Novell, Hewlett-Packard Co. and Xerox Corp. last week announced the availability of Novell Distributed Print Services, an advanced printing architecture designed to improve network printing. It is available now for NetWare 4.1 and IntranetWare. It costs $49.95.

SHORT TAKES Longtime **Electronic Messaging Association** chairman Steve Mahaney has resigned, citing increasing demands in his job as associate director of messaging services at **Pfizer, Inc.** He was succeeded by Martha Hanlon, director of enterprise applications marketing at MCI Communications Corp. ... **Digital Equipment Corp.** last week said it will bundle Enterprise Sever software from Netscape Communications Corp. on all AlphaServer systems running Unix or OpenVMS. ... As part of its 10-year, $3.8 billion IT outsourcing contract with **Electronic Data Systems Corp., Commonwealth Bank of Australia** has placed a 35% stake in EDS Australia for $180 million. ... **Pitney Bowes, Inc.** has licensed elliptic curve cryptography for a new postal meter that attaches to a PC. It will allow users to buy postage electronically and print postal stamps. ... **Hewlett-Packard** has started shipping a CD-ROM server that allows multiple users to share libraries of CD-ROM data across the network.

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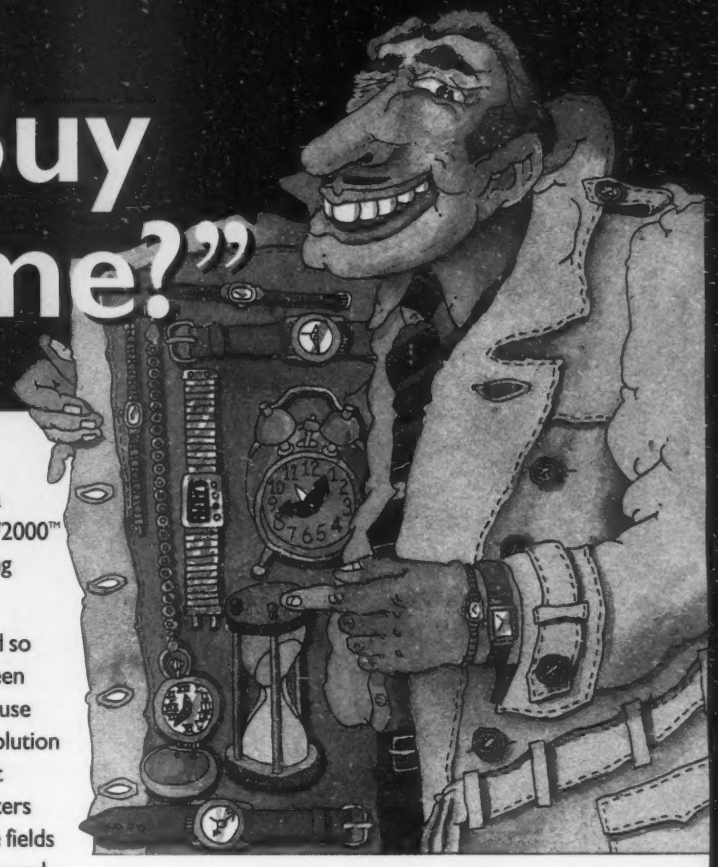

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MCI hacker tracker targets mail bombers

By Matt Hamblen

MAIL BOMBERS, beware.

MCI Communications Corp. plans next week to announce free software that can track down hackers who flood, and sometimes shut down, Internet servers with electronic mail or through other means.

It is called DoS Tracker, for denial of service attack — a ploy in which hackers flood a server with connection requests so it can't respond to others. Users will be able to download the software for free at an MCI World Wide Web site to be announced Oct. 9.

The software will alert a network manager when thousands of similar E-mails arrive at once, MCI spokesman Robert Hoskins said. It will then provide the Internet address or addresses to help find the hacker at the source, following a path back through several servers if necessary.

MCI wouldn't give details but said the software could be used to discover the source of any messages that result in denial of service, including synchronization floods and spam.

Observers said such software would be unique and welcome given the rise in mail bomb incidents. But they wondered if DoS Tracker will be able to track a sophisticated hacker.

"It would be difficult to successfully track where a [good] hacker is coming from," said Philip Carden, a security consultant at The Registry, Inc. in Hoboken, N.J. "It's relatively straightforward for a hacker to alter an E-mail address and a source Internet Protocol address. So this software might be successful in tracking down the unsophisticated hackers, which are a good percentage of [mail bombers]."

"That [software] would be huge; just think of all the crap mail people get on the Internet all the time," said Peter Berns, president of Colomotion, Inc., an Internet exchange in San Francisco.

Berns said he has received mail bombs and similar messages and has clients who have had servers shut down by unwanted E-mail overload. "Being able to track back such messages and shut down the route they took would be amazing," he said.

"This software might be successful in tracking down the unsophisticated hackers, which are a good percentage of [mail bombers]."

– Philip Carden, The Registry

The threat of denial-of-service and mail bomb attacks has forced many of Berns' clients to "overengineer their networks and buy more bandwidth than necessary," he said.

Such software could conceivably save a business money if it meant buying less bandwidth. It might even reduce Internet disconnections worldwide because of excess traffic, Berns said.

Hoskins said the software will make it possible for companies to track hackers and "prosecute the guys and put them in jail."

But whether a business decides to take legal action will vary widely, according to analysts. Many large businesses may prefer to rely on firewalls to filter out such attacks, they said.

Aviel Rubin, co-author of the *Web Security Sourcebook* and a senior technologist at AT&T Labs in Forham Park, N.J., said despite its capabilities, the software wouldn't allow a company to catch a hacker who anonymously writes 10 lines of code on a machine set up in a cybercafe, a university computer science lab or at a trade show to send a mail bomb somewhere. "There's no way to catch some hackers," he said. □

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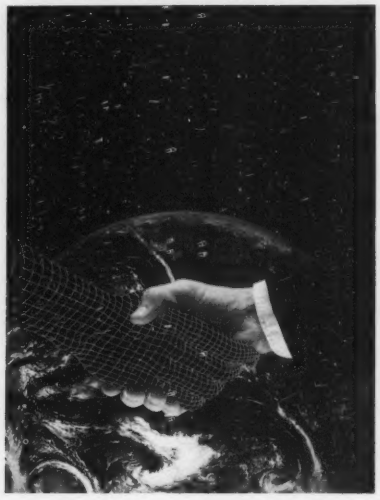

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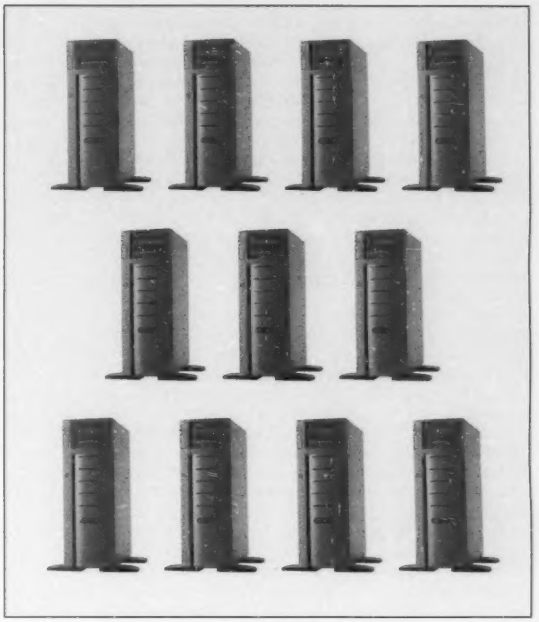

Data from Microsoft funded Zona Research study

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*Based on average number of Microsoft Exchange users per server in Microsoft Exchange vs Lotus Notes: A Cost of Ownership Study, Zona Research Inc., Fall 1996. All other company and product names are the trademarks of their respective owners.

Messaging middleware initiative takes a hit

▸ *Users concerned that group is moving too slow*

By Barb Cole-Gomolski
San Jose, Calif.

SKEPTICAL USERS last week complained that an industry initiative designed to spur the use of message-oriented middleware is moving slowly. They also expressed concern that it is heading down a proprietary path.

Users lobbed tough questions about interoperability at members of the Business Quality Messaging (BQM) panel, which includes Hewlett-Packard Co., IBM, Intel Corp. and Microsoft Corp. The panel addressed several hundred attendees gathered here for the Electronic Messaging Association's Solutions Summit.

ELECTRONIC MESSAGING

Users voiced concerns that the vendor group isn't moving fast enough to develop an application programming interface (API) that would allow BQM-enabled products to interoperate. Several people in the crowd also said they are disappointed that the work of the BQM group isn't happening under the auspices of a standards body, such as the Internet Engineering Task Force (IETF).

The interoperability issue could be a hurdle for BQM, said Steve Mahaney, associate director of electronic messaging services at pharmaceuticals giant Pfizer, Inc. in New York. "Where do we end up once all the vendors add their proprietary hooks?" Mahaney asked.

Most users agreed that the addition of message-oriented middleware could greatly improve the reliability of distributed applications. Eventually, it could enable companies to process transactions — such as credit-card purchases — more reliably over the Internet, users said. Today, if a company installs a message-oriented middleware product from one vendor, it can't be sure that off-the-shelf applications will work with the middleware.

The BQM group has developed a functional specification, which is like a blueprint of how message-oriented middleware should work.

The group claims the specification will let application companies and in-house developers easily include hooks to their respective middleware products. But users said that doesn't guarantee that a third-party product built to run on IBM's MQSeries middleware will automatically work with Microsoft's Message Queuing Server, for example.

"The functional spec doesn't do anything for the user [in terms of interoperability]," said David Gaon, a systems engineer at the U.S. Department of Defense in Reston, Va.

Bruce Robertson, an analyst at Meta Group, Inc. in Stamford, Conn., said the BQM group needs to more clearly define its purpose.

Mark Smith, business manager at Intel, said the approach that the BQM group is taking will benefit users in the long run. "It could take five or six years to develop a specification from the ground up and see it widely implemented in products," he said.

Instead, the BQM group will design a service layer, made up of several APIs, that will facilitate interoperability between BQM-enabled products, Smith said. That service layer is expected next summer, Smith said.

He said he also expects that value-added network providers, such as IBM and AT&T Corp., will work together to offer a network service-level agreement as part of the BQM initiative.

Not all users were critical of the BQM group's approach. "I want this technology now, and I don't want to wait five years for a standard," said a messaging manager at a large Toronto-based publishing company who didn't want her name used.

"I haven't heard any commitment to open standards here," said a messaging manager for a Canadian government agency, who also requested anonymity.

He asked the panel why it seemed to be ignoring efforts under way within the IETF that deal with improving the quality of service of IP networks and running electronic data interchange applications over the Internet. □

BQM SPECIAL INTEREST GROUP

(www.bqm.org)

Founded: April 1997

Based: Kirkland, Wash.

Mission: To advance the development of reliable distributed applications using message-oriented middleware

Founding members: AT&T, HP, IBM, Intel, ISOCOR, The Mesa Group, Meta Group, Microsoft, Pfizer and Redbox Technologies

Work to date: A functional specification that outlines the characteristics of BQM-enabled technology

E-mail, groupware converge

More companies are looking to ditch simple E-mail clients in favor of software that can handle mail and groupware, according to a new study by International Data Corp. (IDC) in Framingham, Mass.

The study indicates that about 60% of companies polled run electronic-mail clients that support collaborative applications. By 2001, that figure is expected to rise to more than 80%, said Mark Levitt, a research manager at IDC. Several factors are driving this convergence, Levitt said. One is that messaging vendors are pushing integrated products that include messaging, calendaring and workflow features. For instance, Lotus Notes, Microsoft Outlook and Novell, Inc.'s GroupWise all support E-mail and collaboration out of the box. And in many organizations, end users are clamoring for more functionality in their E-mail clients, Levitt said.

Improved interoperability among groupware systems also is giving IS departments the go-ahead to deploy collaborative applications, users said. A working group from the IETF is close to completing a specification for sharing calendaring information over the Internet. Mark Chrobak, a senior systems analyst at Northwestern Mutual Life Insurance Co. in Milwaukee, said that specification is key because it ensures that the insurance company will be able to collaborate with customers and brokers. — Barb Cole-Gomolski

Internet mail providers target corporate market

By Barb Cole-Gomolski

IN A MOVE that could spur more firms to outsource E-mail, several Internet electronic-mail service providers are transforming their services to appeal to corporate IT departments.

Still, the pitch will encounter a skeptical audience. Many businesses will have to be convinced that these providers have the bandwidth and services to support enterprise-level messaging.

Companies such as USA.NET, Inc. in Colorado Springs, Bigfoot Partners LP in New York and WhoWhere in Mountain View, Calif., have made names for themselves by giving away millions of free Internet mail accounts. They are now offering fee-based services that could let companies outsource everything from the administration of E-mail servers to name and address directory management.

That approach could help companies avoid investments in hardware, software and people, providing a relatively inexpensive way to deliver messaging to far-flung offices or customers.

COMMERCIAL-FREE

Unlike the consumer services these companies offer — which require users to view banner-style advertising in their E-mail — corporate customers won't see commercials. In another nonconsumer twist, corporate sites will be charged — in the case of Bigfoot, about $10 to $30 per user per year — for their base accounts. Additional services will cost more.

Once available, such services are expected to face competition from Internet service providers, which are also gearing up to offer services such as groupware hosting to corporate customers.

E-mail outsourcing services aren't new, but the onslaught of Internet-based offerings is. The trend toward running messaging systems on IP-based networks is making E-mail outsourcing more feasible, said Nina Burns, president of Creative Networks, Inc. (CNI) in Palo Alto, Calif.

Rising costs also may be a factor. According to a CNI study, a company with 3,000 employees spends an average of $4,189 per user each year to deploy and manage E-mail.

The desire to hold down costs drove First Data Corp. in Omaha to outsource the Internet mail part of its 5,000-user Lotus Development Corp. CC:Mail network to Fabrik Communication, Inc. in San Francisco.

"We believe we are containing costs by avoiding new hires and equipment," said Barb Adams, manager of distributed messaging systems. Outsourcing also allowed First Data to better focus on its planned migration to Notes, she said.

An early Web-based adopter of these services is Thinking Pictures in New York, which produces *Rock.com* and *Stones.com* — Web sites for rock 'n' roll fans and lovers of The Rolling Stones. Last week it announced plans to offer free Internet E-mail accounts to patrons of its Web sites in a bid to boost brand loyalty. The idea is to provide E-mail that prompts users to spend more at the site, which provides a place for fans to buy music, videos and clothing.

"This [E-mail service] will be a profit center from Day 1," said Michael Baumbstein, Thinking Pictures' chief financial officer. The E-mail addresses will be provided and managed by Bigfoot but will bear the domain of Rock.com or Stones.com. Letting Bigfoot manage the service, "allows us to focus on our core business," he added. □

NEW BREED OF OUTSOURCERS

Company	Plans
USA.NET	Commercial services including E-mail post office management, virus scanning and antispamming capabilities
Bigfoot	A service that lets users who have more than one E-mail address have their mail forwarded and retrieved from one address
WhoWhere?	A service for companies to get WhoWhere E-mail offerings with a customized domain name and no ads

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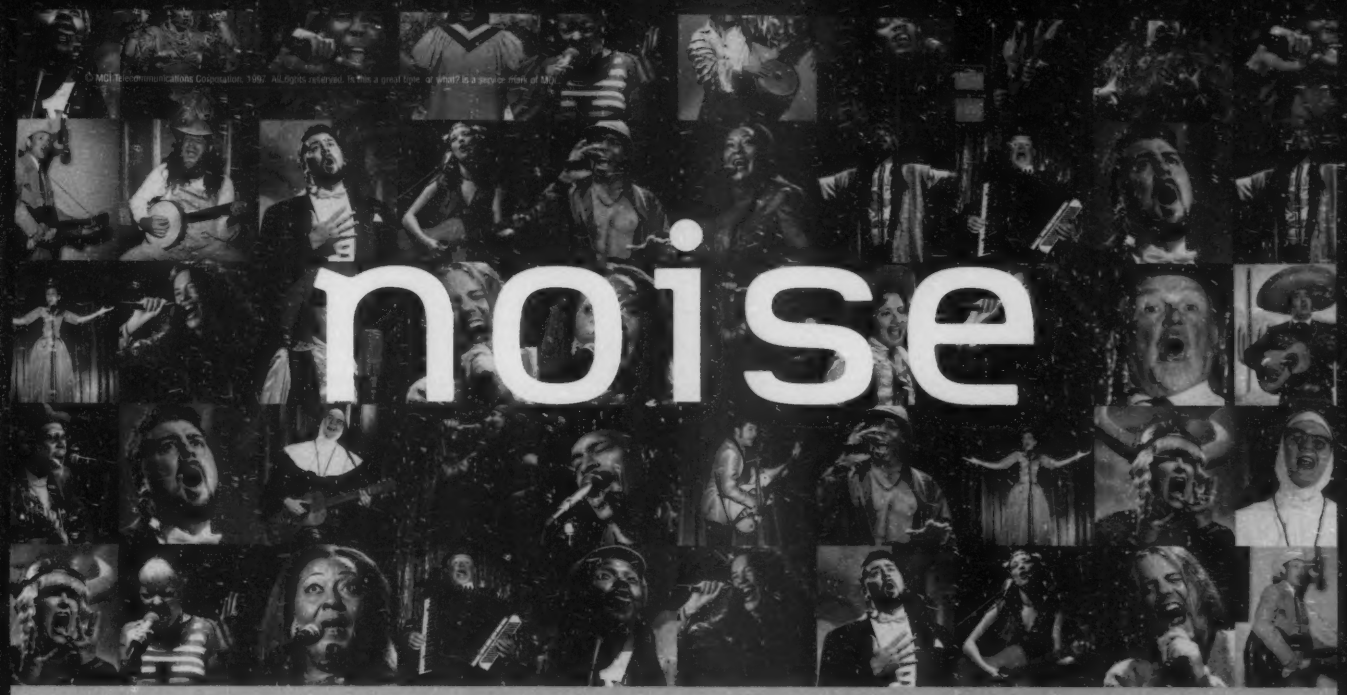

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PROFESSIONAL DEVELOPERS CONFERENCE

Attendees stick by Microsoft, say Java platform isn't essential

By Carol Sliwa and Laura DiDio

MOST OF the developers polled at the Professional Developers Conference said they don't think Microsoft Corp. is exerting pressure on them to not use Java.

"[Microsoft would] rather it not be around," said Susan Trierweiler, a programmer/analyst at the Marshfield Clinic in Marshfield, Wis., which doesn't use Java in writing applications for its 2,000 desktops.

"If you look at the demographics of the client market, cross-platform isn't really an issue."
– Richard Brant, US Quality Algorithms

"I think the message is pretty clear," said Jay Veezhinathan, a development leader at Rohm and Haas Co., a specialty chemical company in Philadelphia. "Microsoft will support it as a programming language, but not as a platform that's going to supplant the underlying operating system."

But cross-platform applications weren't a huge concern for many of the attendees, who tended to be firmly in the Microsoft camp. Although some developers use Java for meaningful applications and others just dabble, alternative languages suit many just fine.

NOT AN ISSUE

"If you look at the demographics of the client market, cross-platform isn't really an issue," said Richard Brant, a systems engineer at US Quality Algorithms, a division of Aetna, Inc. in Middletown, Conn.

"I want to get some real work done. I want speed. Give me a native compiler; I'll be happy," said Bryan Albert, a systems analyst at USAA Information Technology Co. in San Antonio.

Albert said he favors Visual Basic and C++ when writing applications for the insurance company.

Microsoft's contention that Java is merely a language and that Java applications should be optimized for the Windows environment sits well with many developers.

RELATED LINKS

For these and other related links, point your browser at *www.computerworld.com/links/97092javstrat.html*

– Microsoft's Java Strategy: Helping Java Developers Succeed
www.microsoft.com/java/resource/jstratwp.htm

– Microsoft/Java-related articles
www.javaworld.com/javaworld/netnews/index-M.html#Microsoft Corporation

– Sun's Scott McNealy talks about beating Microsoft
http://cwlive.cw.com:8080/home/online9697.nsf/All/970829mcnealy

"If you have a Windows client, then you should take full advantage of all the services available," said Stephen Hayward, an information technology specialist at Dofasco, Inc. in Hamilton, Ontario.

Of the 3,600 clients at the steel manufacturing company, Hayward estimates that only 40 run Unix. □

NT 5.0 beta scores solid reviews from developers

By Laura DiDio
SAN DIEGO

THIS TIME, Microsoft Corp. delivered the goods.

That was the general consensus from the record-breaking 6,200-plus application developers who attended Microsoft's seventh annual Professional Developers Conference (PDC).

"At last year's PDC, Microsoft was in a holding pattern. It was all slideware and promises. Now that I have an actual beta copy of NT 5.0, I believe it's real," said one developer who requested anonymity.

The beta, which was handed out to attendees, includes the long-awaited advanced Active Directory.

NOT ALL THERE YET

But Microsoft senior vice president Jim Allchin acknowledged that some features are still lacking. "Our management services are not simple," he said. And the NT 5.0 beta also lacks the Intellimirroring facility and broad third-party device support in the Active Directory area.

"Users will encounter some setup problems with the NT 5.0 beta. Otherwise, it's a solid product and a massive release; we're betting the company on it," he said.

"Microsoft has gotten its act together and delivered a cohesive set of initiatives and given us firm ship dates for beta and actual product. I can't wait to start working with the NT 5.0 betas," said David Nettles, a systems analyst at Smith Barney, Inc. in New York.

Included in the NT 5.0 beta are advanced features such as an operating system applications Installer, advanced administration through the Microsoft Management console and DirectX 5.0.

The beta will also include Windows 95 plug-and-play support, power management support for laptops and support for disk quotas and a hard disk defragmenter.

Windows NT 5.0 is slated to ship sometime in the second half of next year.

For end users such as Phil Easter, technology strategist at Greyhound Lines, Inc. in Dallas, the conference was a useful event to keep him abreast of technology, but he said it will have little impact on his organization's day-to-day operations.

"I'm still trying to make last year's Windows 95 applications work. I'm actually glad that Windows 98 and Windows NT 5.0 won't ship until next year. I want a decent life cycle for my current products," Easter said. □

Microsoft revamps development tools

CONTINUED FROM PAGE 1

they usually meant going from Windows 3.1 to NT," said Larry Hagerty, senior product manager for Internet security at Tampa, Fla.-based GTE Data Services, Inc., the information technology division of GTE Corp.

PROPRIETARY FORTRESS

Microsoft has long been a bastion of proprietary tools, but it is switching gears to stem Java's growing momentum, which is largely based on its cross-platform capabilities. But Microsoft's solution isn't to make its tools platform-independent. Developers still won't be able to run a Visual Basic application on anything other than a Windows platform.

Instead, the new tools will let developers easily build HTML-based interfaces, which can be accessed through a browser on the Internet by any kind of operating system. Once users access the interface, they will be able to get into the meat of the application, which will sit on the Windows server.

The applications written with the new tools won't travel over the Internet but will be accessible over it.

"Some applications need to be accessed from many different platforms. Our customers have been wanting that," said Michael Risse, group product manager for Microsoft's Visual Studio. "This is what you need to make cross-platform work successfully."

"It has been possible to build these kinds of HTML components for some time, but integrating them with the browser was difficult," said Dave Lingren, director of advanced development at New York-based Dunsgate, a unit of Dun & Bradstreet Corp. "A few leading-edge people did it with mixed success. That's why Java was such an overwhelming success."

Java has taken it on the chin for the past several months because some Java applications run differently from platform to platform, detracting from Sun Microsystems, Inc.'s assertion that the language provides "write once, run anywhere" capabilities.

Microsoft's tool strategy is a major piece of the company's new software architecture, Windows DNA, which was announced last week at its Professional Developers Conference. Dynamic HTML is a key building block of the architecture, which combines features from both Internet and client/server architectures, producing the framework for an application that can run over the Web or on a PC, laptop or network computer.

DNA also includes COM+ for security and memory management as well as OLE DB and Active Data Objects for easier data access.

"This is very encouraging news. In the past, when Microsoft talked about cross-platform, they usually meant going from Windows 3.1 to NT."
– Larry Hagerty, GTE Data Services

One of the key features of COM+, due in beta in the fourth quarter, will be "interceptors" that can dynamically redirect service requests on the fly.

"HTML is a good cross-platform message," said Judith Hurwitz, president of Hurwitz Group, Inc. in Newton, Mass.

"Microsoft's goal is to move up the food chain [from the desktop] to the enterprise, and the feedback they're getting from IT is that Unix isn't going away, the Mac isn't going away and mainframes aren't going away. They've got to live in a cross-platform world," she said.

Hagerty said being able to stick with Visual Basic, in which many of his developers specialize, would save him the expense of training them in Java and buying the needed Java tools.

"Many developers here are experienced in Visual Basic and would prefer to write in [Visual Basic] over Java. Now they may not have to switch to Java. That would save us a lot of money," he said. □

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Word viruses self-mutate

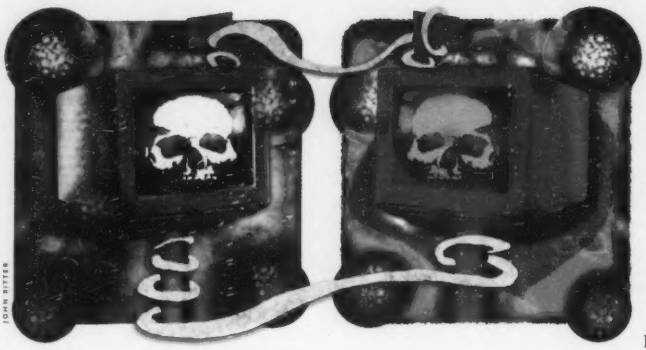
CONTINUED FROM PAGE 1

antivirus software can block and clean only known viruses.

It is unclear whether Microsoft Corp.'s Office 97 might ease the problem of macro virus corruption. Most macro viruses are written for Word. And according to Microsoft officials, there are more than 65 million users of Office applications. The Office suite includes Word.

When Word documents are stored, macros occasionally are corrupted, according to antivirus researchers. If the macro includes a virus planted by a hacker, that virus is slightly altered. That may simply kill the malicious code altogether. But sometimes, the inadvertent change launches a new virus strain.

"It happens quite often," said John Wheat, senior antivirus laboratory analyst at the National Computer Security Association (NCSA) in Carlisle, Pa. When the NCSA lab replicates a virus 500 or 600 times for study, each copy should be identical, he said. "But when you go in and look, they're not." There was no noticeable frequency pattern, he said. Wheat said he believes the viruses are caused by something "deep down in the core of Microsoft Word — how it handles macros."



JOHN RITTER

Microsoft spokesman Andrew Dixon said the company has never received complaints about "good" macros being corrupted. He said Microsoft believes virus authors create code that periodically mutates. "There's no known issue with Word corrupting code within a document," he said.

Although some viruses are designed to self-mutate "in the wild," many experts maintain that unplanned corruptions within the Microsoft environment have created new strains.

But those experts disagree on the effect mutation has had on the rapid increase in macro viruses — which the industry has calculated at more than 1,300 — and the cause of the increase.

The Symantec AntiVirus Research Center in Santa Monica, Calif., estimates that 70% of new macro viruses are created by inadvertent file corruption that is caused by a glitch in the Microsoft environment.

Jimmy Kuo, director of antivirus research at McAfee Associates, Inc. in Santa Clara, Calif., said he believes that is the case for one-half to two-thirds of macro viruses.

Others said the problem is less severe. "This does not happen that much," said Igor Grebert, senior product manager at Trend Micro, Inc. in Cupertino, Calif. Human hackers still are responsible for most new viruses, he said.

The most popular antivirus software on the market checks for virus "signatures" and can catch an altered version if signature code is intact. But if the change is more fundamental, antivirus makers need to develop a new method for detecting and cleaning up the strain.

Systems administrators who are concerned about these new viruses have several options. Some software will let them compile a list of approved document macros and block others. Or Word can be set to notify users when a document includes a macro — with the option of disabling the macro.

IBM's antivirus research center doesn't believe inadvertent mutation is the major cause of new viruses, said research staff member David Chess. But "it happens distressingly often," he said. □

Virus counts have exploded, mainly targeting Word documents. Page 59

Mutant dangers

What causes a virus to suddenly mutate? Several experts agree that it happens, but researchers are still trying to pin down the exact cause.

Many in the antivirus community suspect Microsoft Word. Some believe autosaving a document under certain circumstances can corrupt part of a macro if Word no longer has access to the document it is saving, said Jimmy Kuo, director of antivirus research at McAfee Associates.

Others, including Carey Nachenberg, chief architect at the Symantec AntiVirus Research Center, said the problem lies in Word, a shared Windows library such as OLE or some combination of the two — and possible interaction of a third program.

A separate cause of virus mutation can come from the chance meeting of two viruses in the same document, researchers said. One can partially overwrite the other, creating a new virus with some characteristics of each parent, Nachenberg said.

To combat the rise in new viruses, more and more antivirus vendors are touting "heuristics" — checking a macro's behavior to see if it is potentially malicious, which could theoretically catch new viral strains automatically.

— Sharon Machlis

House committee kills crypto controls amendment

By Sharon Machlis

AFTER SUFFERING two defeats earlier this month over federal encryption policy, the high-tech industry scored a victory last week when the House Commerce Committee rejected controls on the domestic use of encryption software.

Such controls were endorsed earlier this month by another committee, the House Permanent Select Committee on Intelligence. That sparked a flood of criticism from users and vendors who are irate about government restrictions on cryptography within the U.S.

"It was a good win," said Alan Davidson, staff counsel at the Washington-based Center for Democracy and Technology, a civil liberties group that is spearheading opposition to the measure. "It was much better than it had looked even a couple of days earlier."

The Commerce Committee voted 35-16 against a proposal that mandates that encryption software distributed in the U.S. after Jan. 31, 2000, include a way for law enforcement officials to decode any encrypted data in real time, under a court order. That amendment was sponsored by Reps. Michael Oxley (R-Ohio) and Thomas Manton (D-N.Y.).

Among those opposing any mandatory government "back door" access to encrypted data was the Information Systems Security Association (ISSA), a major group of corporate IS security managers.

An ISSA statement said the measure would be too costly and burdensome for businesses that need cryptography to protect customer privacy and trade secrets.

"It's an administrative nightmare for anybody to keep track of all the keys used in encrypted transactions," said Jim Patterson, vice president of security and telecommunications at OppenheimerFunds, Inc. in Denver. "It's going to cost corporate America millions of dollars," he said before the vote.

Other opponents included the Association for Computing Machinery, the U.S. Chamber of Commerce and numerous software vendors, including Microsoft Corp.

SAFE BILL

After rejecting the amendment, the Commerce Committee adopted a version of the Security and Freedom through Encryption (SAFE) bill as initially offered by Rep. Robert W. Goodlatte (R-Va.). It already had been approved by the Judiciary and International Relations committees.

The SAFE bill, which would loosen current restrictions on exporting encryption software, is backed by the computer industry.

With all committee votes on the measure finished, it is up to the House Rules Committee to determine which version of SAFE, if any, is presented to the full House. □

SAFE bill as passed by Commerce

- Encryption software can be exported if similar products are available overseas
- Americans can use any encryption software
- Using encryption to commit a crime is a federal offense
- New National Electronic Technology Center will help law enforcement with encryption issues

Amendment defeated by Commerce

- Encryption software sold in the U.S. after Jan. 31, 2000, must allow court-ordered law-enforcement access to coded data
- Software used before the deadline can still be used
- Export of strong encryption requires a onetime government review
- Encryption sold abroad must allow court-ordered access to coded data

Informix woes worry still-loyal users

By Craig Stedman

THE NEWS keeps going from bad to worse for Informix Software, Inc. — and for the users who are betting their businesses on its databases.

The cumulative weight of Informix's financial problems — which grew heavier still last week with an admission that one-third of last year's product sales might be wiped off the books — is making some customers anxious about the future even as they continue lauding the company's technology. Informix said it must now restate revenue for 1995 and the first half of this year, too.

"I'd be foolish not to be concerned," said Brad Jensen, a vice president at AMR Corp.'s Sabre Group subsidiary in Fort Worth, Texas. "I'd have a lot less explaining to do if they were healthy. Obviously, it's not an ideal situation."

REID HOSH

Sabre's Brad Jensen: Informix's public image "has gotten quite a bad beating, and they deserve it"

Sabre is building an object-based data warehouse on Informix's Universal Server software for AMR's American Airlines unit. Informix's development and support "has actually gotten better after all the bad news came out," Jensen said. But Sabre has made contingency plans in case Informix sinks like a stone.

One option is a switch to Oracle Corp., Jensen said. Informix's third-quarter results and revision of its recent financial statements will be closely watched, he said. "But their technology is so superior that I have faith it will be around even if someone has to buy Informix," he said.

Informix officials last week said the restatements might wipe out more than $200 million of last year's revenue — double what Informix had previously estimated. The Menlo Park, Calif., company also said it now expects to take at least $50 million in 1995 sales off the books.

Even the new figures are only "rough estimates," Informix officials said.

The revision, blamed last month on "errors" in the booking of sales, is being widened to include more indirect channel shipments that apparently never reached the hands of end users. Informix officials said the company now is booking sales "very conservatively."

The 1996 hit would chop Informix's original $939 million revenue total by more than 20%. Taking service revenue out of the equation, the revision would hack Informix's 1996 software sales by about a third, said Carl Olofson, an analyst at International Data Corp. in Framingham, Mass.

"I've never heard of a software company misrepresenting its revenue by this much," Olofson said. "They essentially didn't grow at all last year."

The revisions are primarily accounting maneuvers that shouldn't impact Informix's cash flow, said James Pickrel, a stock analyst at Hambrecht & Quist, Inc. in San Francisco. "But the way the story is unfolding is just disastrous." Informix's image is getting shredded and management time is being wasted on the financial sins of the past, Pickrel said.

Informix is "getting horrible publicity," said Jeffrey Brewer, vice president of technology at CitySearch, Inc. in Pasadena, Calif. "I'm always concerned, but [the latest news] doesn't affect how I feel about their technology." □

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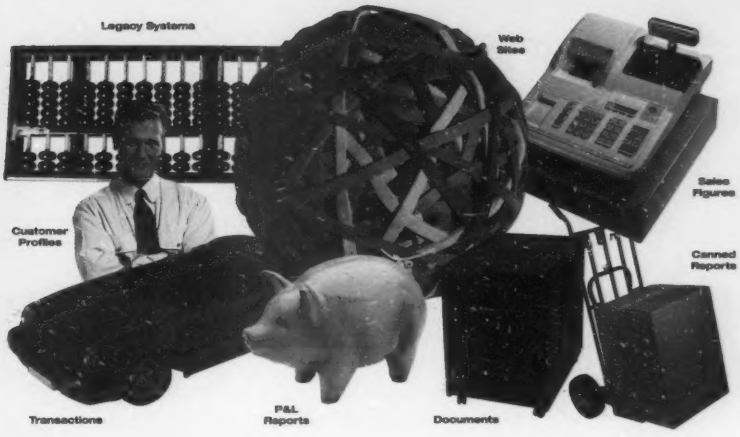

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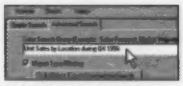

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Tools pull pieces of large Web sites together

▶ *Offerings from MKS, Vignette, Actra and others help IS and business managers collaborate*

By Mitch Wagner

MORTICE KERN SYSTEMS, INC. (MKS) plans in November to ship an upgraded version of its Web Integrity software platform with features designed to make it easier for business managers and techies to collaborate on building very large World Wide Web sites.

"One of the problems you face on the wonderful world of the Web is that it's very easy to create something the first time, but it's very hard to manage that thing on an ongoing basis," said Ed Glassman, director of information technology strategy at Pfizer, Inc. in New York.

A chief virtue of the MKS product, Glassman said, is that it helps companies with version control — updating Web sites a section at a time in an organized fashion.

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MORE CHOICES

MKS, in Waterloo, Ontario, was one of three companies that recently announced high-end publishing tools for Web sites that contain thousands of pages of data that change daily, hourly or even every few minutes.

Vignette Corp. in Austin, Texas, last week announced Story Server 3, a Web-based document management system that combines Web site creation tools with a server for deploying the pages.

And Actra Business Systems LLC has announced PublishingXpert 2.0, a platform for deploying large Web sites in high-demand conditions. Actra is a joint venture of Netscape Communications Corp. and General Electric Information Systems, Inc.

"One of the problems you face on the Web is that it's very easy to create something the first time, but it's very hard to manage that thing on an ongoing basis."
– Ed Glassman, Pfizer

"As organizations are looking to build more serious applications, they're recognizing that not only do you need good development tools, but you need to manage the development process," said analyst Stan Lepeak at Meta Group, Inc. in Stamford, Conn.

"A good Web developer has both business and technical skills. But in the real world, very few of those people exist. So you have to find a way of getting the people with business skills and technical skills to work together," Lepeak said.

WHAT YOU GET

New features in Web Integrity 2.2 include WebLens, which was designed to let users place multiple files of text, graphics, multimedia content and executable software in individual projects that can be viewed — and approved — as a group.

Rather than having to click through each file individually, a webmaster or editor responsible for approving content on a site can view a change in a staging area and mix unapproved content with already-public content to see how the changes would look if approved. The MKS software costs $15,000.

MKS, Actra and Vignette are just three companies attempting to provide products for high-demand sites created by teams.

Traditional enterprise vendors such as IBM and Oracle Corp. also have offerings in that area, as do start-ups such as Wallop Software, Inc. □

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IBM adds pieces to modular storage system

By Tim Ouellette

THE FOG IS STARTING to clear from IBM's Seascape storage scheme.

IBM last week began shipping Network Storage Manager 2, an update to its plug-and-play network tape backup system. And IBM this fall will announce plans to deliver a high-end open systems storage array that will compete with EMC Corp.'s Symmetrix systems and provide the building blocks for sharing data among different servers.

But until more products are delivered, users and analysts won't know if the plan will float.

Seascape is IBM's modular storage architecture made up of Magstar tape systems, 7133 SSA disk arrays, Adstar Distributed Storage Manager backup software and RS/6000 processors.

The intent is to make it easy for users to bolt the pieces together to provide different storage services managed by a central server [CW, June 23].

For example, IBM was able to quickly deliver Network Storage Manager 2 — with a number of new models and sizes targeted at small and midsize shops — only four months after the original systems shipped (see chart). And the new disk system being developed will be a large complex of existing 7133 SSA disk arrays that users can link together. They won't have to buy new boxes.

BACKUP BUNDLE SPREADS ITS WINGS

IBM's Network Storage Manager 2 will add:

- Five new models targeted at users with small and midsize storage needs
- Enhanced connectivity options for 100M bit/sec. ATM and Ethernet
- Choice of Magstar, Magstar MP or DLT cartridges
- Optional disaster-recovery and hierarchical storage management features

That gap at the Unix high end must be filled for Seascape to be successful in the fast-growing world of open systems disk arrays, said Thomas B. Lahive, an analyst at Dataquest in San Jose, Calif.

WINNING PRODUCTS

So far, tape-based products such as Network Storage Manager and Virtual Tape Server have been the only examples of Seascape's modular approach. But they have been very successful.

"As IBM moves down to smaller configurations with [Network Storage Manager], there will be more demand for these turnkey solutions. It is one-stop-shopping network backup that can address the cost of management of distributed servers," said John McArthur, an analyst at International Data Corp. in Framingham, Mass.

Bill Brong, a user of Network Storage Manager 1, said the bundle cut down the time it would normally take to test and install the hardware, tape software and backup software needed to properly back up Unix and Novell, Inc. NetWare servers.

His company, PP&L, Inc., jumped at the chance to quickly set up a backup scheme for its 48 Unix and 46 NetWare servers dispersed companywide.

"We would either have had to add the staff — a thing you never say anymore — or introduce automation into the process," said Brong, supervisor of technology development at the Allentown, Pa., utility.

Pricing for Network Storage Manager 2 models starts at $80,000. □

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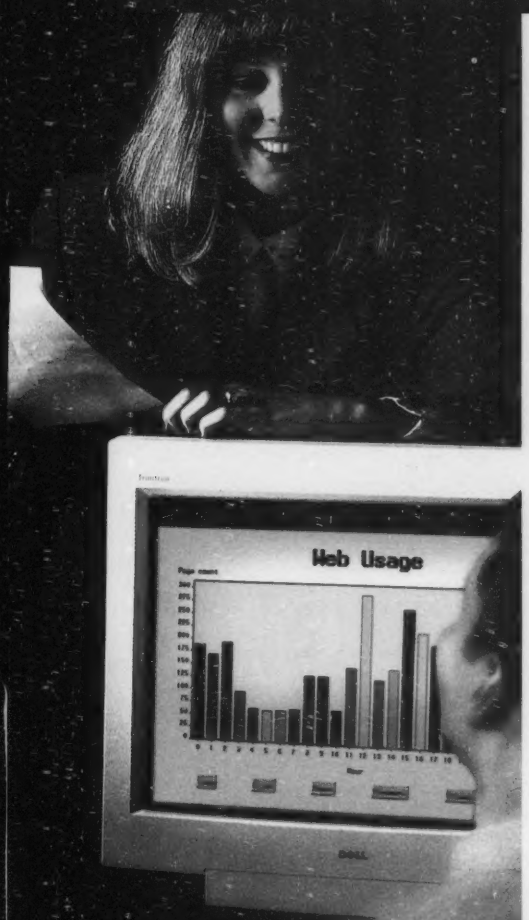

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Brokerages show how to make money on the 'net

CONTINUED FROM PAGE 1

that other industries — from travel to insurance — can learn from the online trading world.

Andrew Whinston, an electronic-commerce researcher at the University of Texas in Austin, said online brokers are profitable because they sell basically virtual products.

"They don't have a lot of storage or shipping costs, since what they're brokering is information that can be sent out over the Internet," Whinston said.

The result: Internet brokers are expected to capture almost 30% of the discount stock-brokerage market this year.

By 2001, online trades may soak up 60% of that discount market and 10% of all retail stock commissions, according to Piper Jaffray research.

The growth of online trading has come at the expense of traditional full-service firms such as Merrill Lynch & Co. and Paine-Webber Group, Inc., which risk alienating their brokers if they move into online trading, Burnham said.

Charles Schwab & Co. in New York has the largest market share in the online trading industry, and its accounts are growing like fertilized kudzu.

In the past 18 months, the number of online Schwab accounts has almost tripled to 960,000, and those accounts hold a total of $68 billion in assets.

A year ago, fewer than one of every four Schwab trades took place online; now more than 36% of Schwab's 114,700 daily total trades come through the Internet.

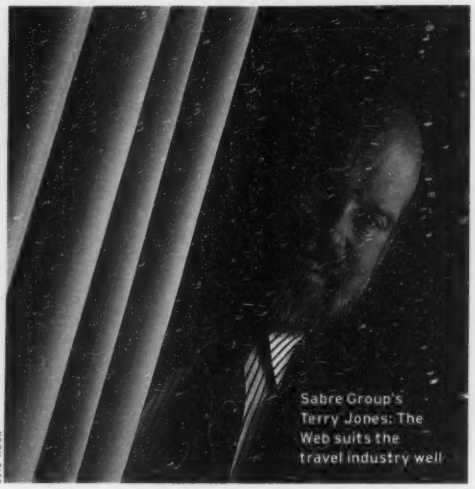
Meanwhile, E-Trade handles close to 20,000 online stock trades each day and has seen the number of its account holders grow from 91,000 last year to more than 200,000.

Online trading is a perfect example of using the Internet to remove the middlemen from traditional, off-line transactions, said Michael Murphy, a market analyst and editor of the "California Technology Stock Letter" in Half Moon Bay, Calif.

"In the case of stockbrokers, you had an information intermediary who was not only annoying but expensive, too," Murphy said.

"Why should anyone pay a broker $70 or $100 just to execute a stock trade when they can pay as little as $10 to make the same trade themselves?" Murphy asked.

The big trading houses would argue that their customers are paying for advice and information. But more and more free online services offer volumes of investment-related information.



REID HOBA

Sabre Group's Terry Jones: The Web suits the travel industry well

VIRTUAL WALL STREET

Last year, online traders had no expectations of short-term profits, but this year half of them are seeing the money roll in

Are you making money with online trading?

Base: 50 investment companies

Source: Forrester Research, Inc., Cambridge, Mass.

EFFICIENT ENGINES

At the heart of the online brokerage business are highly efficient transaction engines that turn a customer's order into an actual stock purchase. Michael Gazala, an analyst at Forrester Research in Cambridge, Mass., said online firms with good technology can cut the cost of a stock transaction by as much as 75% compared with the traditional broker-and-ticket process.

The flip side is that online brokers have to invest heavily in technology. Schwab, for example, plows 11% to 14% of its revenue into technology, spokesman Bob Taggart said.

Despite these booming times, online brokerages face some challenges, including tighter regulations, tougher competition and a shortage of technical talent to keep their World Wide Web sites operating, updated and user-friendly. "Vendors forget about the human side of supporting these services. Just putting up a Web site ... doesn't work," Taggart said.

The expectations of customers continue to rise, too.

Message traffic in the Internet stock market discussion groups shows that online investors don't tolerate Web sites that grow stale or are too complex to navigate.

"Ease of use is increasingly important," said Rebecca Patton, a senior vice president at E-Trade's advanced products division. "Two years ago, it wasn't so much, but now people have high expectations and much less willingness to deal with frustrations.

"[Online trading] used to be a commodity market; it was all about cheap trades. But it has very quickly become more about the whole experience — how connected you can make people feel to the markets and the kinds of tools you give them," Patton said.

Online investors get a tremendous sense of empowerment from taking charge of their own finances, said David Forrest, community coordinator at The Motley Fool, Inc., the provider of America Online, Inc.'s popular investment section. "The seduction of online trading is the sense of empowerment. You're controlling it and hitting the 'send' button."

Forrest said other information-rich business transactions, such as buying books and booking travel, have the same characteristics.

Terry Jones, chief information officer at Dallas-based Sabre Group, Inc., which is the developer of the Travelocity Web site, agreed.

"Travel is, in a sense, a virtual product and highly computerized," Jones said. "You can look at airlines as financial instruments flying in formation, and customers are buying positions in those instruments."

Before customers make any final decisions, they want to get as much information as possible about flights, accommodations and destinations.

"And our products are highly visual," Jones said. "People want to see their hotels, which the Web can really do well."

Murphy said "insurance could be the next to follow this model," because its focus is on information rather than a tangible product.

Patton advised other industries testing the online waters to focus on two critical success factors: usability and branding. "Whether you are Yahoo, Amazon.com or E-Trade, this is a brand business that depends on a consistent, trustworthy brand," she said. □

A BULL MARKET

Online trading has skyrocketed in the past year and is expected to continue steady growth during the next five years

	Online commissions	Online accounts
1996	$286M	120,000
1997*	$614M	2.3M
2001*	$2.2B	12.6M

*Projected

Source: Piper Jaffray, Inc., Minneapolis, and Forrester Research, Inc., Cambridge, Mass.

Big banks join game

It was only a matter of time.

Now that online stock trading has become profitable, big banks are starting to take notice — not to stop the trend, but to get onboard as quickly as possible.

In fact, the strong market for online trading has made the online brokerages almost too attractive, said David Forrest, community coordinator at The Motley Fool investment information service.

For example, this month Fleet Financial Group announced plans to buy Quick & Reilly, Inc., and Mellon Bank Corp. is buying Pacific Discount Brokerage. Previously, Lombard Brokerage, Inc., one of the original online brokers, was bought by Dean Witter, Discover & Co. to form Discover Brokerage Direct.

The acquisitions let the big houses get into electronic commerce without completely revamping their traditional brokerage operations. The banks want to become one-stop shops for all their customers' financial needs.

"Banks are buying up these guys because they are in a mad rush to get more and more assets under management," said Paul Stapleton, president of Stapleton & Associates in Boulder, Colo. "That's where the real money can be made."

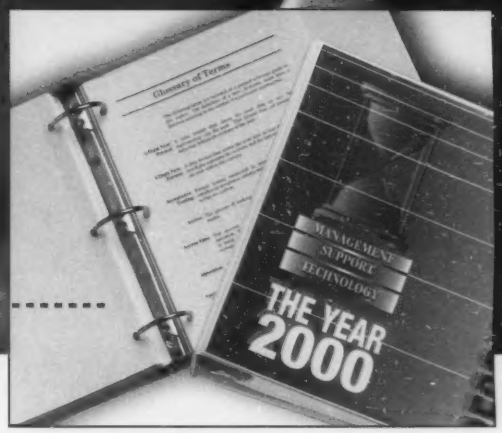
Expect more of a shakeout in coming months, according to a recent report from Piper Jaffray.

Some of that will be the result of new market requirements from the Securities and Exchange Commission that narrow the bid/ask spread on stocks. By trimming that spread, traditional and online brokerages won't be able to make as much clear profit on each transaction that goes through their offices. And that leaves them scrambling for cash to expand their businesses by adding more services to their Web sites or branching out into new offerings.

When the stock-market boom ends and trading volume falls, several online brokerages also will feel the squeeze and could accept acquisition offers from banks looking to hook more customers to a full range of services, industry watchers said.

— Tim Ouellette and Stewart Deck

THERE IS NO ESCAPE



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Computer Industry

SSA gets back in the saddle again

▶ *Company's revenue grows after painful product transition*

By Randy Weston

SYSTEM SOFTWARE Associates, Inc. (SSA) may have been down for the count the past year, but the business system software maker appears to be back in the fight. SSA hit hard times when its AS/400-based technology fell behind competitors such as SAP AG and Oracle Corp., which offered client/server-based products.

BUSINESS PROCESS AUTOMATION

Then SSA almost self-destructed as it raced to leapfrog the competition with an object-oriented version of the software.

But these days the company is "participating in more deals, making the short list at companies and winning some of those new clients," said Jim Shepherd, an analyst at Advanced Manufacturing Research, Inc. in Boston.

"They still have enormous functionality in their product," he said. "The one thing that has always distinguished their BPCS product is it has great functionality." BPCS is SSA's business process automation software system.

TRANSITION TRAUMA

The transition to the new distributed object technology used in BPCS, which came out in September 1996, also was partly responsible for SSA's near-death experience. The company had problems selling the product, and creating it required a huge capital investment.

CEO and founder Roger Covey said his company planned to spend $125 million revamping BPCS but ended up spending $200 million.

SSA's sales plummeted during the transition period, as customers held off on purchases until the technology overhaul was completed, according to Bill McSpadden, an analyst at Plant-Wide Research Group, Inc. in Billerica, Mass.

Marketing woes also hurt the company's transition. "The problem was they tried to sell technology the past year," McSpadden said. "You don't sell technology; you sell solutions."

"[SSA's] installed based just didn't understand the new technology as well as the old AS/400 system," he said.

SSA has no place to go but up in the business system software market

Company	1997 revenue	Growth rate 1996 to 1997
SAP	$3.1B	30%
Oracle	$1.4B	70%
PeopleSoft	$833M	85%
J. D. Edwards	$657M	38%
Baan	$640M	65%
SSA	$435M	28%

Source: Plant-Wide Research Group, Inc., Billerica, Mass.

But SSA has returned its marketing focus to solving customer business problems. The effort is beginning to show results. Revenue will grow about 30% this year (see chart).

The company also received an infusion of capital from stock sales and investment, its debt is wiped out, and the new product brings it into the technology forefront. SSA also has a long-standing and large installed base of about 8,500 companies worldwide.

GETTING AHEAD

And SSA now has a jump on its competitors. "The major application vendors need to be in the world of distributed objects," Shepherd said.

He said pieces of the software system that SSA has released so far in the new distributed environment, such as supply-chain management and financials, are well-constructed, even if other applications aren't up to speed yet.

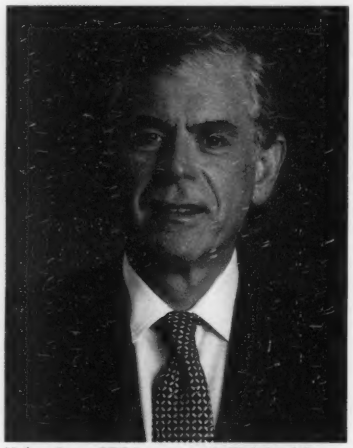
Most of the other vendors, including SAP, are moving to the distributed object systems, which allows companies to not only operate a single system in multiple locations but more easily adapt the systems to changes in the business because business logic is stored as objects rather than lines of code. □

Unisys appoints Andersen vet as CEO

▶ *Weinbach will steer high-end systems maker down IT services path*

By Jaikumar Vijayan

LAST WEEK'S appointment of Lawrence A. Weinbach to lead Unisys Corp. underscores the company's transformation from high-end systems to information technology services.



Unisys' new CEO Lawrence A. Weinbach has years of IT services experience, but he faces big challenges, according to one analyst

Weinbach comes to Unisys after eight years as CEO of Andersen Worldwide, during which he steered the firm from a $2.3 billion entity to a $11 billion professional services powerhouse.

He replaces James A. Unruh, who in June announced his decision to step down from his position as CEO of the Blue Bell, Pa., company.

Until recently, Unisys was known for mainframes enterprise servers and midrange hardware. But in the past few years, an increasing amount of its revenue has come from IT services and support. In 1996, more than 62% of total Unisys revenue came from those areas.

BEEN THERE, DONE THAT

Analysts expect Weinbach will leverage his Andersen experience — and the corporate contacts he built in the process — to build Unisys' services business.

But he will have his hands full putting out several short-term fires, according to Lisa Ross, an analyst at International Data Corp. in Framingham, Mass.

For instance, the company's most recent two quarters have been modestly profitable, but Unisys still has to pay back an accumulated debt of more than $2 billion.

GROWING REVENUE

The company's service revenue has been growing, but profits haven't kept pace. As a result, Unisys pulled out of several unprofitable contracts earlier this year.

"They have also had senior management turnover and haven't won too many major contracts this year," Ross said. "It's going to be a big challenge for [Weinbach] to overcome all these issues." □

• The cost of restructuring

Corel anticipates more losses

By Gordon Mah Ung

COREL CORP. expects to lose from $15 million to $20 million in its fourth quarter as it continues to change its focus from retail to corporate customers.

The company made the forecast during a teleconference detailing the $31.4 million loss it suffered during the third quarter, which ended in August. Executives from the Ottawa company said the bleeding isn't expected to extend past the fourth quarter.

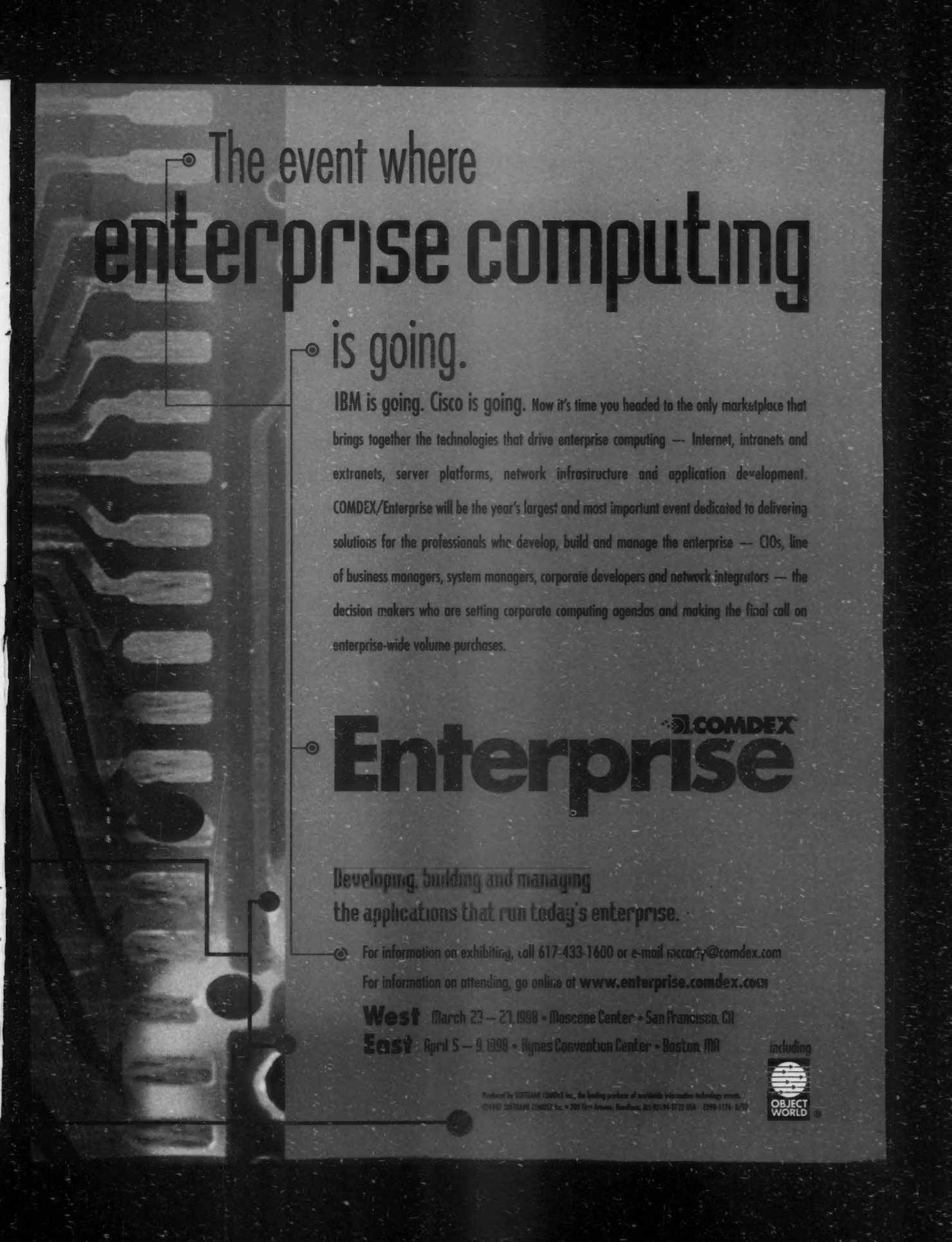
Corel officials said the company will continue to pare down its numerous consumer titles as it concentrates on the corporate market. The company sold its computer-aided drafting, video-editing and flowcharting titles to International Microcomputer Software, Inc. (IMSI) in San Rafael, Calif. Corel will receive about $5.6 million in common stock and cash, and royalties and development payments from IMSI.

PRODUCT PUSH

Corel executives said potential revenue from the company's Java-based Alta product, the Video Network Computer and Remagen technology could push up profits.

"We have been through a period of extensive growth and restructuring," said Michael Cowpland, Corel's president and CEO. "Looking forward to next quarter, I am extremely confident in our new focus on corporate sales, the approval of our Enterprise Java strategy and traditionally strong fall sales."

Corel officials also said they expect to increase the compatibility of Corel's WordPerfect suite with Microsoft Corp.'s Office 97 in order to hold on to market share. □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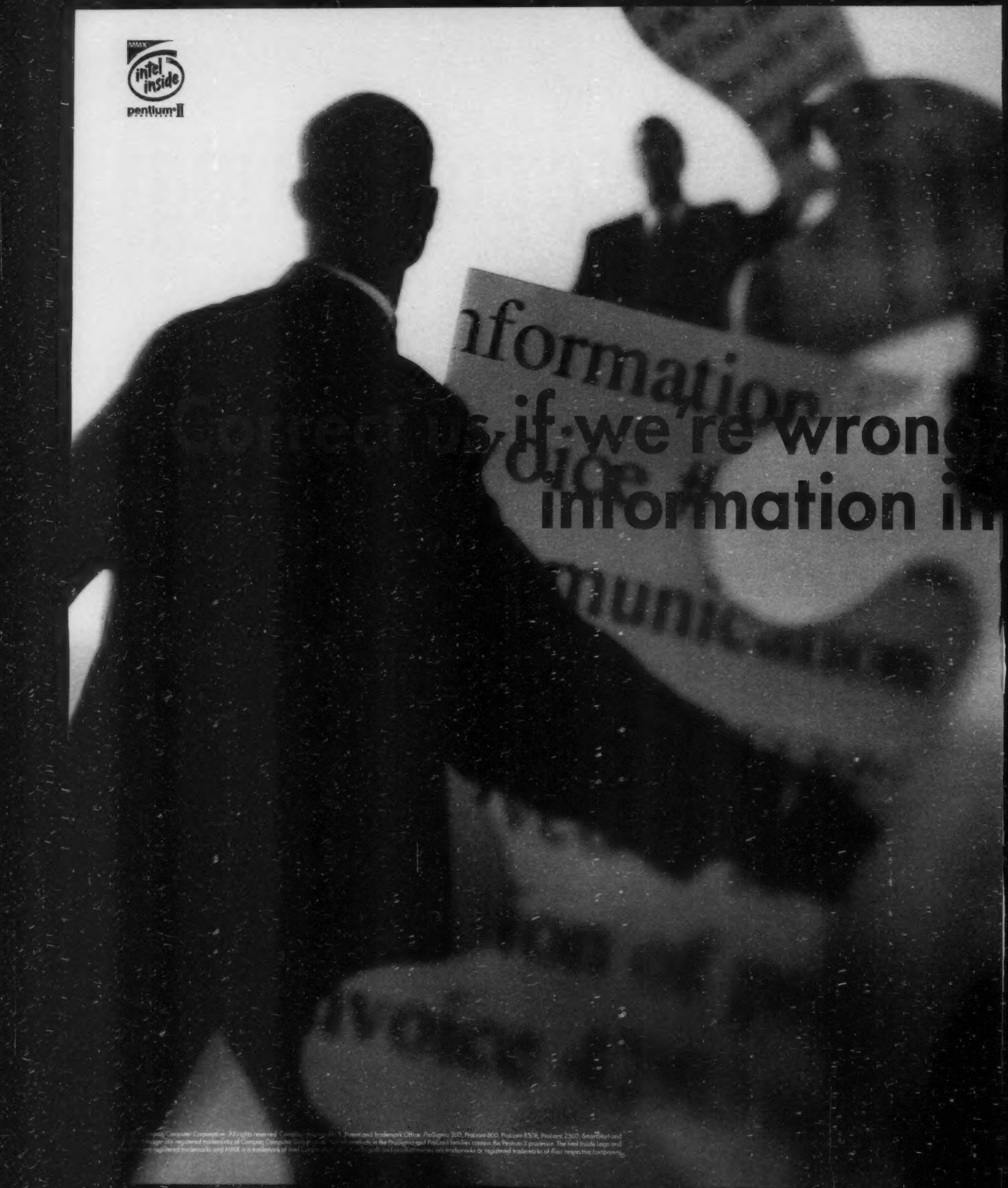
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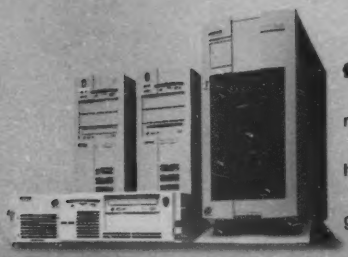

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OPINION

Death by dithering I'm reading the numbers and having trouble believing them.

Half of all new software projects nationwide supposedly run over budget by more than 180%. Even worse, abandoned or scrapped IS development work sends an estimated $59 billion in corporate dollars right down a rat hole every year ["Project management ills cost businesses plenty," CW, Sept. 22].

How do we keep getting away with this? No other industry does.

Gartner Group estimates that only 15% of companies have set up central IS project offices, which happens to be step No. 1 in doing project management right. The other steps are hardly rocket science: Use standard procedures to estimate costs, track time and resources, and document changes.

Ironically, the actual technology choices rarely turn out to be the culprits in failed projects. The chronic shortage of skilled technolabor carries some of the blame, but it certainly isn't the root cause.

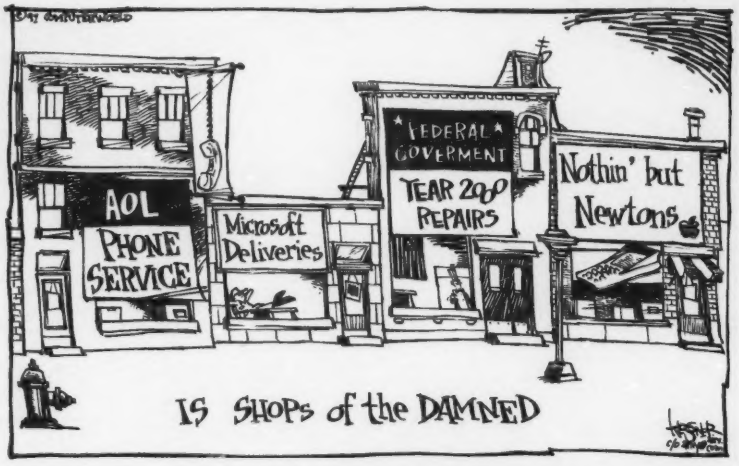
So what's up with this? I asked that of Michael Pehl, a longtime consultant in complex SAP client/server implementations and now CEO of I-Cube in Cambridge, Mass. His small technology services and integration firm lists Mercedes-Benz and McDonnell Douglas among its clients.

The most common mistakes Pehl sees — over and over again — are failing to appoint and empower a project champion, losing focus on the business goals and time-consuming hand-wringing over the plan details. Death by dithering, in other words.

The cure is tough but very straightforward. IS project teams have to start moving forward *much* more quickly, tackling the riskiest work first.

The alternative? Keep on meeting and planning ad nauseam, while the outsourcers clear out your desks and follow that famous Nike slogan.

Maryfran Johnson, *Executive editor*
Internet: *maryfran_johnson@cw.com*



LETTERS

PeopleSoft customers dispute service criticisms

YOUR FRONT PAGE story "Users rap PeopleSoft service" [CW, Sept. 15] suggests a groundswell of discontent among PeopleSoft customers over the company's inability to support its rapidly growing installed base.

The supporting evidence for this claim, however, is flimsy at best. Your reporter cites comments from PeopleSoft customers attending the PeopleSoft User Conference in Orlando.

By seeking out discontent among PeopleSoft's user community, your reporter missed the big picture: A leading enterprise application vendor assembles 11,000 users, partners and employees to exchange ideas, explore issues and plan for the future.

In fact, PeopleSoft is known for its high levels of customer satisfaction, and that trend shows no signs changing.

As recently as August, a third-party survey indicated that more than 98% of customers said they are satisfied, and 80% of those customers indicated they are very satisfied.

Moreover, 99% said they would buy from PeopleSoft again.

Jim Bozzini
Vice president
Customer service operations
PeopleSoft, Inc.
Pleasanton, Calif.

Editor's reply: *Upon review, we agree that our headline, "Users rap PeopleSoft service," overstated the customer dissatisfaction that was expressed in the story. Computerworld strives for fairness and accuracy in all its reporting, and we regret the lapse in this case.*

I AM WRITING TO express my displeasure with the inclusion of Green Mountain Coffee Roasters in *Computerworld*'s article, "Users rap PeopleSoft service."

I was not consulted on this article, and your implication that we are not happy with PeopleSoft service is untrue.

I assume your reporter was referring back to his notes from our May 5 interview, where I had discussed the problem we had getting help with the correct skills for our implementation in January and February.

> PeopleSoft consultants are on-site and doing a great job.

I believe I also stated at that time that the new services manager for our district had done a much better job of providing resources. And in fact, we had a top-notch consultant on site at the time of your reporter's visit.

Since the time of our interview, PeopleSoft has continued to provide critical resources and support from both the services organization and the development organization when needed.

At this point we have three consultants/senior consultants on-site and doing a great job for us.

I have no problem telling it like it is when I'm not getting good service from a business partner, but that simply isn't the case with PeopleSoft.

Jim Prevo
Chief information officer
Green Mountain
Coffee Roasters, Inc.
Waterbury, Vt.
jim.prevo@gmcr.com

AS CUSTOMERS and members of the PeopleSoft International Customer Advisory Board, we have worked closely with PeopleSoft to make strides in delivering exceptional customer service, particularly in the problem resolution process.

As your Sept. 15 article indicates, PeopleSoft knows their customers are most important to them.

PeopleSoft has not only added people to their Global Support Center and development teams, but has also totally redesigned its problem resolution process.

This company creates an environment at their conferences that encourages customers to talk openly with them and express their interests and needs.

To the casual observer, these expressions may appear to indicate dissatisfaction, but customers appreciate this openness, and they know that PeopleSoft listens to them.

Sandy Myskowski
President
PeopleSoft International Customer
Advisory Board
Reading, Pa.

More letters, page 41

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

In defense of the AS/400

Andrew Borts

Today's technology arguments start with someone trying to pick a fight. For programmers of IBM's AS/400, it starts with someone asking, "Why do you work with the AS/400?"

I think people are trying to tell me that programming in Unix or Visual Basic is the real technology for today's systems. I feel like telling them, "Look, the last time I programmed in Basic, Bill Gates programmed it on a paper tape, and Jimmy Carter was president." And isn't Unix more than 20 years old?

Users think the AS/400 is old technology. But the last time I wrote in Basic, Jimmy Carter was president.

Why doesn't anyone like my system? It looks cool, all black and sleek. The AS/ 400 even starred in the James Bond movie *Goldeneye* and the Keanu Reeves film *Chain Reaction*.

When I talk to PC fans, I argue that the value of a computer system is all a matter of application. I find myself asking, "You want to store a few million records on your PC?" And they answer yes, as if that truly should be done.

It's hard for a programmer to describe to a user that waiting two hours watching the cursor blink on a badly abused PC is torture. You sit agonizing, staring at the laboring desktop system as if watching it will make it leap like a gazelle.

Why would I want to do that when I can use a computer that receives the same result in minutes? An AS/400 that includes its own database engine and operating system?

The user stares and says, "The AS/400 is costly. A Windows NT or Unix system is much cheaper."

I explain that after the purchase of the database and other software you don't get with Unix or Windows NT, you'll surpass the AS/400's base cost, because most of that is in the operating system. But that doesn't work.

I try the car analogy. "With a race car, an expensive pit crew constantly maintains the car at peak efficiency. Would you use that same car to tow a house? Wouldn't you rather use a truck? It'll haul much more stuff more efficiently. It'll be cheaper over the long run."

The user's usual reply gives me a mega-headache: "But the race car goes really fast. It must be faster than that old AS/400 of yours."

Eight years ago, I was told the AS/400 had reached the end of its useful life. Since then, the AS/400 has had facelifts. Now it's shorter, aerodynamic and 64-bit. And throughout those changes, my programming skills have transferred seamlessly.

I hear arguments that the AS/400 is "old" technology and you have to move to "new" technology.

If the system runs a native 64-bit operating system and it converts all of my legacy applications to run faster than before, is that old? Is it old if its updates keep thousands of existing software packages compatible? Many of the "newer" systems run in 32-bit mode, and the older applications that go with those systems still run in 16-bit mode. That's more advanced? Am I missing something?

Another argument is that the AS/400 is a proprietary system.

That implies I can run a program written for Windows 95 on a Unix workstation using terminal emulation. As if that could happen.

And now, with Microsoft trying to make sure Java doesn't catch on, I'll be using proprietary Java within Windows, while programming nonproprietary Java for the rest. Isn't everything proprietary these days?

I say, pick on someone your own size. My computer can beat up your computer any day. □

Borts is a computer consultant at Systematic Control, Inc. in Davie, Fla. He can be reached at andrewb@sysctl.com.

Whom do you want to build your computers?

John Gantz

By now, if you follow the fortunes of PC manufacturers, you know that the vendors that sell through resellers are feeling the heat from direct sellers such as Dell, Gateway and Micron.

According to International Data Corp.'s (IDC) latest data, released earlier this month, unit shipments of PCs through the direct channel are up 43% for the first half of this year over the same period last year. Sales through normal reseller channels were up only 13%. That's sales, not profits.

The reason isn't that the direct vendors make fabulously better computers or offer ridiculously lower costs — they don't — but that they can offer quicker, more customized delivery and more personalized customer service. They deal directly with their customers.

Any large reseller ought to be able to beat any single vendor in economies of scale of distribution, logistics, order handling and the like, which is why the channel sprang up in the first place. But there's lots of duplication of effort as products move from vendor through distributor through reseller to user. Multiple sales forces, multiple billing entities, inventory all over the place, price protection and spiffs for resellers, and so on. On average, that duplication accounts for anywhere from 12% to 20% of product cost.

While Dell, Gateway and Micron have eliminated these middleman costs by eliminating the middleman, the indirect vendors are trying to do it another way — by getting the channel to configure and build computers. They're setting up "virtual supply chains" and sharing resources, such as quality control and inspection engineers, with the channel. Just cutting the 50 to 70 days that units typically sit in inventory during various stages of distribution would go a long way toward perking up the margins of vendors that sell through the channel. The idea makes sense, and resellers such as MicroAge, Inacomp and Entex are working hard to become more like manufacturers — by building quality centers, beefing up configuration engineering and offering more presale and postsale service — than classic wholesalers. Over time, expect the vendors to outsource more building and shipment of computers to them. Some of them already lease space and people from the manufacturers for these services.

For users, this will bring about some funny consequences. For instance, will a Hewlett-Packard PC configured and assembled by Inacomp work the same as one made and assembled by Entex? When Honda first started building cars in the U.S., cars built in Marysville, Ohio, didn't run the same as those built in Japan.

Will a PC built by HP but configured by Inacomp work the same?

If you buy a reseller's house brand, how different will it be from ones the reseller builds for name-brand vendors?

Like most shotgun marriages, this new one between indirect vendors and channel players will have its ups and downs. For years, each side has complained about the other as each tried to offset shrinking margins by taking margin points away from the other. Now they have to fight against a common enemy.

And that, too, may change. Many resellers are already moving product from the direct vendors, either to give customers what they want or under quiet arrangement with the vendors. As they add more value in the supply chain besides simple stocking, order taking and delivery, they may well become attractive partners even for vendors selling direct.

So watch for lots of discontinuities while the manufacturers and channel partners get used to a new business model. And try not to get caught in the middle. □

Gantz is a senior vice president at IDC in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

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are the 25 international organizations flexing their networking muscle.

What

trends and business issues are driving acquisition of networking's key components:

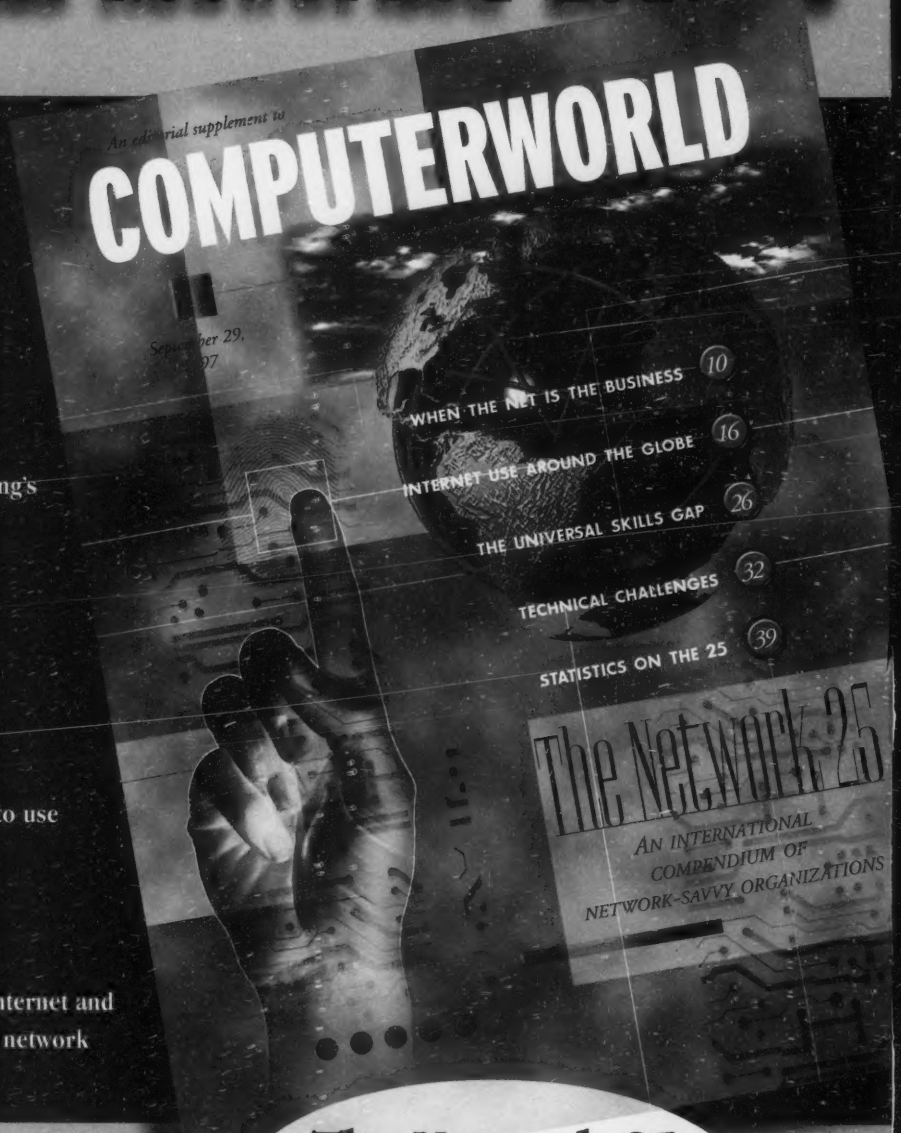
- WAN and telecom services
- E-mail and messaging software
- LANs/switching, routing and wiring
- Mobile/cellular/satellite technology

Where

they're putting this technology to use for business success.

How

the growing global use of the Internet and related technologies affects the network infrastructure today.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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
Intranet Products ❑ Yes ❑ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
(a) ❑ Internet software
(b) ❑ Internet browsers
(c) ❑ Web authoring/development tools

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LETTERS

READ THESE! GREAT OPPORTUNITY! ACT NOW!

HAL MAYFORTH

WHILE READING about the efforts of companies to protect their brand images in the face of "spam attacks" ["Spam attacks send angry firms to court," CW, Aug. 18], I was struck with a great sense of irony. Spam is a registered trademark of Hormel Corp., and Hormel has tried very hard to protect its trademark. Yet even *Computerworld* continues to associate the term "spam" with an evil act. Not exactly what I would consider preserving a product's good name!

To add further to the irony, I took a quick look at Hormel's home page (*www.hormel.com*). It seems the makers of Spam were themselves the victim of "spamming." They, of course, referred to it as "unsolicited E-mail."

John Figura
Bloomington, Minn.
jfigura@concentric.net

Part of IT skills shortage lies with employers

COMPUTERWORLD HAS been running many articles about people trying to find employment in the field.

You keep printing stories about how consultants are taking the best people and how corporate IT shops cannot find good employees. My own experience is telling me that some of the problem is with the employers, not the employees. I recently finished my course work at Syracuse University in the Masters Program in Information Resource Management. I entered the program in 1996 after 23 years of being in sales and sales management.

What I am finding out is that if you want a position in IT management, you better have been a programmer first. I did not want to learn programming. Instead, I focused on the strategic uses of IT for companies and database management. The [help wanted] ads always ask for customer-focused people with good problem-solving skills, good communications skills and the ability to learn. But then in the fine print they want years of programming experience.

Maybe companies need to be a bit more daring. They are probably passing up many good prospects by being so shortsighted.

Gilbert Maker
Rochester, N.Y.
maker@ican.net

IN RESPONSE TO the sidebar article in your In Depth report of Aug. 25 on "spam," ["In defense of spam"], David Silver has it all wrong. He apparently believes it would be OK for him to barge uninvited into my living room or my office and harangue me — the exact parallel of spamming. I purchased my computer. I pay for the use of the telephone lines and the Internet service. There is no First Amendment issue, since free speech applies to a public forum, and my home and office are not public.

What Silver does amounts to criminal trespass and invasion of privacy. He and others like him should stay off the Internet.

Paul R. Cooley
Culver City, Calif.

Companies killed loyalty

LESLIE GOFF'S ARTICLE about the spiraling salary demands of IS professionals ["Desperate times, desperate measures," CW, Aug. 11] will come as vindication to the masses of programmers who have been downsized in the past several years. After reading that manager's rant about lack of employee loyalty, I would like managers to ask themselves, Who killed loyalty, anyway?

After years of layoffs, outsourcing and "temping," companies have found that their cost cutting has failed, and they have created a workforce that has no loyalty. The frustrated manager in that article finally found three IS employees who had been with that company for an average of 10 years and trained them instead of recruiting from outside. Management is now reaping what it has been sowing. Given the costs of their loyalty-free job market, I wonder if they will decide to recreate some loyalty again.

Dean Schulze
Arvada, Colo.

I RECENTLY STARTED a business selling screen savers that I have written. I have to watch every penny, and this means finding an inexpensive way to market my screen savers. I spent about a week compiling a list of local E-mail addresses and sent out an advertisement to about 1,800 of them. Reading some of the responses I got, one would think I committed a felony. It's not simple enough to reply back and ask to be removed from my list. Rather I had people swearing at me and threatening me.

Why is it that some feel it's OK to threaten an honest man looking to make a living using the tools he has available to him? Is it that hard to hit the delete button if you don't want to read a message? Is it harder than throwing out that junk mail or hanging up the phone on an unwanted call?

Edward Finch
Derby, Conn.
itsosimple@aol.com

Quality often overlooked

I JUST FINISHED reading Miryam Williamson's article titled "Quality pays" in a recent edition of *Computerworld* [Aug. 18 Special Report]. It is one of the most interesting, pertinent, factual and erudite articles published on software quality assurance I have read in a long while. The achievement of quality is always overlooked in all but the most forward-thinking of IT enterprises. My company specializes in providing testing, simulation and comparison products to the Tandem computer user marketplace. Many of our customers are testing year 2000 changes — at least 50% of any year 2000 date change project.

Neil J. Bason
President
SoftSell Business Systems, Inc.
Sausalito, Calif.
neilb@softsell.com

'net doesn't affect quality, but greedy users do

THE INTERNET IS neither friend nor enemy of software quality ["Crash!" Up Front column, Aug 18]. People serve in either (or both) of those roles. The way they "practice" computing is key.

I was disappointed that you reformatted your disk without ever determining a cause. Maybe your PC has a hardware problem. Maybe you had a parity error in a machine without ECC. Maybe software was not a culprit at all. In medicine, when a patient dies, we push for an autopsy as the ultimate in quality control.

Scot Silverstein
Director of Clinical Information
Christiana Care Health System
Wilmington, Del.

Make the world better

IN A WORLD WHERE technology is driven by ROI, revenue and the bottom line, it was refreshing to read both Maryfran Johnson's editorial on "What matters" [CW, Aug. 18] and the original story about how the Web helped Guam in its time of crisis ["Guam tragedy spurs Web aid," CW, Aug. 11].

When will our industry wake up to the fact that our fantastic silicon creations should be used more often as tools to better the human condition and not just to make companies and stockholders rich? Fortunately, some companies, mine included, have seen the light and are applying some of our technology products and services to create a positive impact on human lives. It can take so little in time and money to make a big difference and better our world.

Leona M. Seufert
President
Star Quest
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Partner benefits ignored

AGAIN, COMPUTERWORLD'S Best Places to Work issue has completely neglected any mention of domestic partner benefits for same-sex and opposite-sex couples. This, in the year that IBM has begun offering them. Are there no gays and lesbians in the computer industry? Don't their families count?

The PC software industry pioneered this redefinition of family structure, and *Computerworld*'s parent company, International Data Group, Inc., also offers these benefits.

Marianne Seggerman
Westport, Conn.

ABOUT PAUL GILLIN'S "Crash!" Up Front column: Isn't that the truth! Everyone has to personalize their computers with their own screen savers, sounds, etc. I really wish the major operating system vendors would release versions with an administrator desktop and a user desktop. The administrator would be able to decide exactly what the user was able to load.

This means no "start" menu in Windows 95 for the people who don't need it and only a word processor and some other basics for secretaries. I know that some people probably do this with networking, but I'm talking about a stand-alone system that doesn't access any programs over a network.

Ricky Hardt
Houston
weasprimus@earthlink.net

Quality just takes time

IN THE "Sound off" feature in your Aug. 18 issue, I want to comment on whether "speed of delivery with buggy software" is worth more than quality control. It made me think about the times I take my car in to be worked on. If I want a rush job and the car still has problems, I got what I wanted: an incomplete, buggy result.

When I take it in, I tell them I want it done right (i.e., to the best of their abilities). With today's need for immediate gratification in all things, we'll just have to learn to cope with delays for a quality product. If we can't, then we've learned nothing.

Colin J. Schmidt
Bixby, Okla.

Blame the source

I AM JUST WRITING to express my thanks to news editor Patricia Keefe for her editorial ["Responsibility," CW, Sept. 8]. I could not agree more. The one who downloads pornography — as unethical as that person is — should not be punished any more than those who buy pornographic magazines from a local store. If child pornography is downloaded, shame on that person, but more shame on those who put it out there and worse to those who make it. The same applies to Internet service providers and their clients.

Jeff Malmquist
University of Georgia
Athens, Ga.

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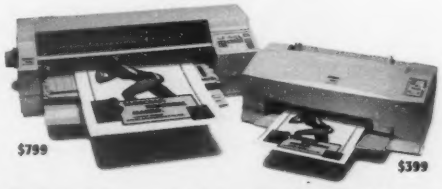

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Given all that, it's no wonder 80% of the Fortune 100 rely on McAfee for network security. The big question, though, is why would the other 20% go with anyone else? For more information, call 1-800-332-9966, department 324.

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Year 2-what?

In a recent study conducted by Arlington, Mass.-based Cutter Consortium, 41% of responding organizations said they haven't explored the business consequences of the year 2000 programming problem.

Free workshops

Metrix, Inc., a service management vendor in Waukesha, Wis., plans to offer free workshops for information technology professionals who want to learn how enterprise service organizations can use technology to boost customer satisfaction and increase their return on investment.

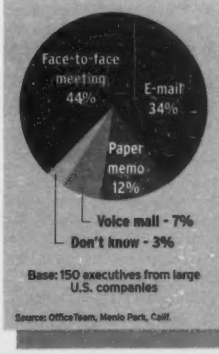
The four-hour workshops include insights on how to maximize service profits by increasing productivity and reducing resource requirements.

Registration is available at *www.metrix-inc.com* on the World Wide Web or by telephone at (800) 543-2130, ext. 5000.

THIERRY COSEF

Face-to-face

Which form of business communication do you prefer?



Base: 150 executives from large U.S. companies

Source: OfficeTeam, Menlo Park, Calif.

Mainframe skills pop up all over

By Tim Ouellette
PHILADELPHIA

THE BEST PEOPLE to manage your client/server systems may come from the mainframe world.

Although some companies are cutting back their use of mainframe systems or throwing them away, staff with mainframe skills are in more demand than ever.

MAINFRAME SKILLS

The caveat: Mainframers must be willing to accept change and train in newer platforms and technologies, said information technology managers at this month's AFCOM user group conference here.

"If the [information systems staff] are willing to change to try new technology, they can be an integral part of reining in client/server costs," said Russ Duncan, a systems architect at the Church of Jesus Christ of Latter-day Saints in Salt Lake City.

SYSTEM SHIFT

The church has moved off its mainframe to VMS systems from Digital Equipment Corp., among other platforms.

Duncan said besides hiring new personnel, two of his best staffers came from the mainframe side to learn the new platform.

"They knew what it meant to have automation, so they were able to point out the holes in the DEC product," Duncan said.

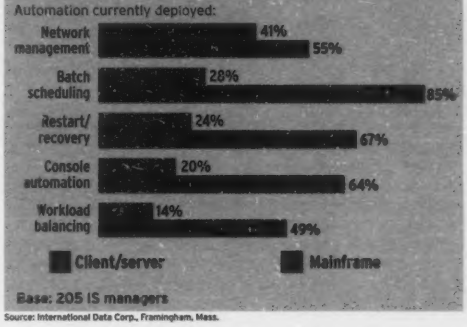
Observers agreed that the same skills that served mainframes in the past can be valuable in pulling client/server systems up to the enterprise level.

"The management skills

Mainframe skills, page 46

Learning from experience

Mainframe shops that move to client/server may want to retain their staff, most of whom have a long history in automating IS operations



Base: 205 IS managers

Source: International Data Corp., Framingham, Mass.

Utility jolts productivity through user-led effort

▶ *SaskEnergy unclogs paper jam, fills more orders*

By Thomas Hoffman

A WORK MANAGEMENT automation project driven by end users at a Canadian utility has helped the company increase employee productivity by more than 20%.

Until recently, SaskEnergy, a natural gas utility in Regina, Saskatchewan, used most of the same processes it used when it was founded in the late 1950s to distribute natural gas to its 300,000 residential, commercial, farm and industrial customers.

Even after the natural gas market was deregulated in Canada 10 years ago, the company, which has $1.1 billion (U.S. $792 million) in assets, remained awash in paperwork — even when it had a straightforward project, such as installing new pipe to connect service for a customer.

When a new customer wanted gas service, a request would be passed from one department to another. Because the offices for some departments, such as customer service and engineering, are up to 800 miles apart, signing off on those projects could take as long as three weeks.

PROBLEMS WITH PAPER

The paper jam also made it tough for the utility's managers to estimate and track the costs of new construction, often leading SaskEnergy to order construction materials such as pipe and fittings at the eleventh hour at above-market rates.

"When we were paper-based, we were always three to four weeks behind on [project] cost information," said Rand Luhning, work management administrator at SaskEnergy. Through automation, SaskEnergy now can outline materials and costs for projects ahead of time, enabling its number-crunchers to make funds available at better

Utility, page 46

TALENT SEARCH

Upgrades create skills gaps

By Craig Stedman

FLEET FINANCIAL GROUP, INC. is shelling out almost $38 million to build a data warehouse and a new customer marketing system as well as hire a 50-person team to run the analysis software it will use to develop more targeted advertising and promotions.

There wasn't much choice on the latter investment. The new marketing approach requires workers who know how to use database marketing software, plus statistical and decision-support analysts. None of those skills was much in evidence in the Boston-based bank's marketing department before the data warehouse project began.

"We have a good marketing staff, but they aren't statisticians or data miners," said Randy Grossman, senior vice president of customer data management and analysis at Fleet. "It would have been like building a power boat and not having anybody who knows how to drive it."

ONE OF MANY

Fleet isn't alone in having to stock up on new talent. Newfangled software may give companies more targeted and effective methods of reaching out to customers, but companies also have to infuse or augment their marketing departments with people who can handle the technology.

Upgrades, page 46

CAROL LEE

Fleet's Randy Grossman: The bank needs skilled analysts "who can tease insights" out of the new marketing system it is installing

Mainframe skills still in demand

CONTINUED FROM PAGE 45

needed are the same in both environments, but the tools aren't there today in the distributed world," said W. P. "Doc" Holiday, president of Leading Special Projects, Inc., a consultancy in Crestview Hills, Ky.

And businesses are scrambling to find those skills in a tight job market, either through existing staff or with temporary contract staff.

AFCOM, based in Chicago, is made up of about 1,800 member organizations and focuses on data center issues.

"Everyone wants these people again — they went and learned other technology," said Gary Lucas, director of national marketing at Computemp, an IS staffing agency in Boca Raton, Fla.

Lucas said the data center positions in which Computemp places people aren't even short-term, temporary assignments, but really long-term stays — measured in months and years — to nurse data center changes along.

A spokeswoman for Interim Technology, a placement firm in Trevose, Pa., said that where there used to be only a few temporary staffing firms for data centers, there now are hundreds providing such services.

CHANGE IS OUR FRIEND

Users at the AFCOM conference said mainframers often resist training on newer platforms such as Windows NT or Unix. But they said it is important for programmers to make the change — both for their own benefit and that of the company that needs their experience.

"If you are not riding the wave of change, you'll soon be beneath it," said Bob Rothenberger, assistant director of computer operations at Provident Mutual Life Insurance Co. in Berwyn, Pa.□

Utility jolts productivity with user effort

CONTINUED FROM PAGE 45

interest rates, Luhning said.

By now, most utilities have automated all or parts of their work management processes, industry observers said.

"It's important to use automation to streamline those processes whenever you can," said Bill Terrell, manager of exploration systems planning at Anadarko Petroleum Corp., a Houston-based explorer and refiner of crude oil and natural gas.

STAFF INITIATES CHANGE

It was SaskEnergy's staff — not its executives — who recognized the utility's shortcomings. "It was the employees who recognized that we had to change" to remain competitive, Luhning said.

"That was a little unique," said Jim Cypert, vice president of marketing at Logica, Inc.'s Energy and Utility division in Houston, which won the automation contract. "I think [SaskEnergy's] employees knew what was available in the market and pressed for automation."

Since installing the $3 million SaskEnergy Labour and Material Application (SELMA) system last December, the utility has exceeded its conservative estimates of improving employee productivity by 20% and cutting capital expenses by 2%, Luhning said.

The company also handles 30% to 40% more orders this year over its busiest year ever with the same number of employees. SaskEnergy's 350 employees in the work management area have handled 12,000 installations for new customers this year. The utility has a total of 800 workers.

Construction planning is critical to SaskEnergy, because pipe installation in Saskatchewan has to be planned and completed before winter sets in by mid-October and the ground freezes.

SOME PROBLEMS

Despite SELMA's benefits, SaskEnergy and Logica still have a few bugs to work out. For example, system response time is slow and end users have to enter much of the data themselves. That forces design engineers to spend an extra 10 to 25 minutes every time they need to order construction materials, said Ken Pasieychnyk, manager of engineering at the utility.

"That's a sore point with a lot of the staff because it's adding time" to the ordering process, Pasieychnyk said. He added that the system is otherwise helping him manipulate workload data better.

Luhning said Logica is working to make the system faster. As for SaskEnergy's engineers, he said, "It's more work now, but at [the construction season's] end there won't be a crunch" to order materials, and data collected will be more accurate.

To help distribute the added workload more evenly, SaskEnergy plans to shift employees into departments where they are most needed beginning next year, Luhning said.□

AT A GLANCE

SaskEnergy

A natural gas utility in Regina, Saskatchewan, that serves 300,000 residential, farm, commercial and industrial customers

▸Challenge

To automate paper-based work management processes used to support gas distribution to customers

▸Solution

Logica's Work Management Information System

▸Investment

$3 million (includes hardware upgrades, software licensing, training and testing)

▸Results

Productivity gains by employees greater than the 20% projection and a 2% reduction in capital budget

Upgrades create skills gaps in companies

CONTINUED FROM PAGE 45

And that is sometimes easier said than done.

"There's a real shortage of talent in this area," said Scott Nelson, an analyst at Gartner Group, Inc. in Stamford, Conn. "You need people who are technical and marketing-oriented, but finding them is hard."

Uncovering experts who know both technology and the brokerage business has been "extremely difficult," said Mary Kelley, vice president of database and relationship marketing at Charles Schwab & Co. in San Francisco. "And I don't think there's any real strong education process going on to create those people," she said.

TEAM EFFORT

As part of its massive data warehousing project, Fleet is installing database marketing software developed by Exchange Applications, Inc. in Boston [CW, Sept. 22]. It also plans to use statistical analysis software from SAS Institute, Inc. in Cary, N.C., and query tools from Cognos, Inc. in Ottawa.

One statistician hired by Fleet was a former nuclear physicist with a business degree from Cornell. "I can now honestly say that in the event we do need a rocket scientist, we have one," said Randy Grossman, senior vice president of customer data management and analysis at Fleet.

The team of analysts and database marketers that Grossman puts together will work hand in hand with Fleet's marketing department to create and fine-tune promotions that target different groups of customers. Grossman has 35 people working for him and said he expects to add 15 more as the data warehouse starts being used early next year.

Federal Express Corp. faced the same staffing need a year ago when it built a marketing data mart and installed Exchange's ValEx software and other analytical tools to move away from mass marketing campaigns.

NEW SKILLS NEEDED

"We had to get a completely new set of skills," said Sharanjit Singh, director of marketing analysis at FedEx in Memphis. The delivery company's marketing department now has a mix of traditional marketers and technology-savvy analysts.

"Everything is basically done in a team now," Singh said.

The changes have given FedEx the flexibility to develop marketing campaigns that target anywhere from 5,000 to 700,000 customers. "We can slice and dice just as much as we want to and send different things to different people based on what they likely will respond to," Singh said.□

SHORTS

Shell software

Simulation Sciences, Inc., a Brea, Calif., developer of simulation software for the petroleum and petrochemical industries, completed agreements to acquire business planning software from Shell Oil Products Co. for $1.5 million. Simulation Sciences plans to use the software to develop and market an enterprise optimization system for the process industry.

MCI outsources

MCI Systemhouse signed a four-year, $13.7 million managed services agreement with Caliber Learning Network, Inc. to provide the Columbia, Md.-based distance-learning company with single-source WAN/LAN help desk management and support.

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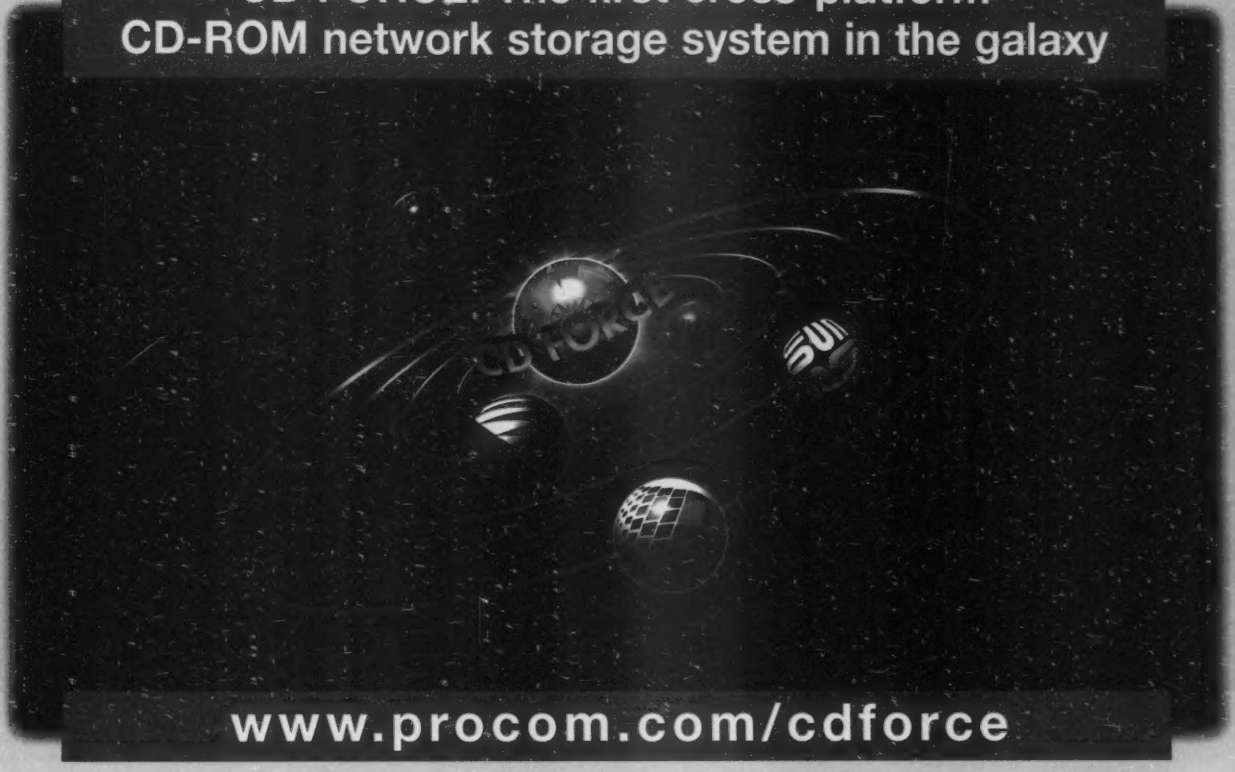

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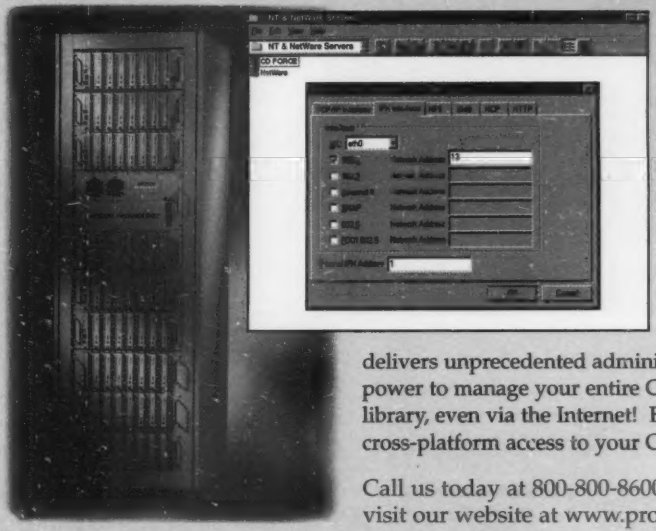

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When you're ready to try Sun products, we have someone to recommend.

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The Merisel Open Computing Alliance congratulates Peripheral Vision InfoSystems, Inc., for being named one of Computerworld's top 10 resellers in Sun's Innovators Contest.

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ALLIANCES

Certification is just part of the value-add for Sun VARs

"The IT customer wants to know that a VAR is more than just four walls and a warehouse."

IT'S A GOOD TIME FOR END USERS TO BE PURCHASING FROM A SUN MICROSYSTEMS VAR.

For one thing, Sun's philosophy that "the network is the computer" is taking hold, with many organizations beginning to explore server-centric architectures.

Another reason is the scalability of Sun's product line, which many resellers cite as a key advantage for them when selling workgroup- and enterprise-level solutions to their customers.

For Sun, which currently has 600 value-added resellers, or VARs, those two words—value-added—are key. "We do look for companies that add significant value, not box pushers" says Ed Zander, president of Sun Microsystems Computer Co.

Box pushers, says Zander, can't fill the needs of a company that is looking for people who understand its existing environment and Sun technology and who can also provide a full-fledged IT solution. "They're looking for someone to build and maintain a heterogenous environment, not someone who's merely authorized to ship a box," he says.

How can a user be sure that the VAR is a total solution provider that truly understands all these technologies? The answer: certification. Certification indicates that a reseller has made a commitment to the Sun product line. It means the VAR has found the time to make its key employees experts in Sun technology. And it is no one-time investment; the VAR has to keep sustaining its certification with ongoing education in order to meet Sun's stringent requirements.

Although certification can make customers feel secure about the implementation of enterprise-wide mission-critical systems, the purpose of certification is in some ways no different than a brand name on a consumer product, says Zander. "As a consumer, you want to know that the product is a quality one, and that the vendor has a commitment to customer satisfaction. Similarly, the IT customer wants to know that a VAR is more than just four walls and a warehouse."

Sun resellers can be certified at one of four levels: Workgroup Computing, Enterprise Computing, Specialty and Enterprise Elite. Having these four options is important because an end user may need someone familiar with the workgroup level, or someone more geared to the enterprise level. They may need a VAR who understands client/server interoperability with a mainframe, or one who can work at the database level.

And if they need a reseller that can help them with open systems, they've come to the right place. Sun has another piece of the enterprise computing puzzle —Java—and its resellers are key to the evolution and deployment of Java applications. "Our resellers are writing applications and helping applications get developed," says Zander. "They are writing code; they are providing training courses for end users. In 1998, they will be a major source of delivery for JavaStations. Whether our VARs are in training or application development or deploying thin client solutions, all of them will be necessary [in the Java effort]," he says.

It is clear that VARs play a big role in Sun's across-the-board strategy. "They're an extension of our sales force, and our sales force is part of our philosophy," says Zander. "They're evangelizing many of the infrastructure concepts that we're talking about."

The Ergonomic

THE ERGONOMIC GROUP
191 Herricks Road
Garden City Park, NY 11040
(516) 746-7777 Home page: www.ergogroup.com

The mission of The Ergonomic Group, which has been in business for 14 years, has become one of the leading systems integrators in the Metro-NY area. Its mission is to set up a complete infrastructure for customers, including the creation of Web sites. The company focuses on client/server network computing technologies, and embraces many different levels of network integration, including design, integration, test and management.

The company is certified to sell the entire line of Sun products, including a specialty certification for the Enterprise Elite level. According to Frank Scozzari, the company's regional director of sales, The Ergonomic Group was the first company in the Northeast to be Sun-certified at the Elite level. The company currently maintains a staff of more than 90 employees, 30% of which is technical staff.

According to Scozzari, the company's business mix is currently 65% targeted at the enterprise level and 35% at the workgroup level. More of the business is gravitating toward the enterprise level, and Scozzari says that is due to the Sun product line. "New products in the last 18 months have brought Sun more into the enterprise environment," he says.

"During those 18 months we've gone from the workgroup more into the enterprise level. Some of this has to do with the customer as well. There are changing philosophies about computing, and Sun has a tremendous product line to address these philosophies."

Scozzari sums it up by saying, "We see Sun as the optimal solution because they cover Java-based computing and the enterprise."

INTERVIEW WITH:

FRANK SCOZZARI
REGIONAL DIRECTOR OF SALES

Q: *What is the difference between certification and authorization?*

A: Authorization is no more than the ability to sell the product on paper. Certification means many things: That the company has invested in, and believes in, the vendor. That the company can sell, implement and maintain the product. And that the company knows that product through and through.

Q: *Why is certification important to the potential customer?*

A: Through certification, the customer can be assured that a company has experts that know the product line, that it has worked with the product a lot, and has insight into it.

Q: *Does getting that message across to the customer require an educational effort on your part?*

A: Definitely. The Sun certification process is only a few years old and word is just now getting out.

Q: *What changes would you like to see in the process?*

A: I'd like to see the certification process put into the direct seller and user perspectives. This would take things to the next plateau, where users and resellers can be certified, and would allow all specialists in specific areas to be certified. For instance, all engineers would be certified.

Q: *What do you see as the next critical IT shift?*

A: "Javatizing" applications. Companies are moving away from fat clients to thin clients. This is a new paradigm, and we want to help companies build this enterprise computing solution. We can address this by working with our customers to plan and design bandwidth utilization and support thin clients.

Q: *What are you doing with Java?*

A: In order to sell Java-based computing solutions you need to have Javatized internally, so we're doing that now. We have some internal demo systems up. Externally, we want to help the customer Javatize their applications. We see Java as the next paradigm, and we want to support it.

ADVANCED SYSTEMS GROUP

ADVANCED SYSTEMS GROUP, INC.
12301 N. Grant Street, Suite 130
Denver, Colo. 80241
(303) 457-4786 Home page: www.virtual.com

Advanced Systems Group, Inc. started in 1981 as a ComputerLand franchise, but repositioned itself in 1989 to sell client/server, Unix-based solutions. Today the company is a leading systems integrator, providing configuration, installation, implementation and maintenance support. The fastest growing segment of the company's business is professional services.

Sun solutions are at the core of Advanced Systems Group's business. The company, which is certified at the Enterprise Computing level, sells all Sun hardware and software products, including SunSoft solutions.

The company estimates that 75% of its business is at the enterprise level, with the remainder at the workgroup level. As its business gravitates toward the enterprise level, the company is required to make certain changes, according to John Murphy, executive vice president of Advanced Systems Group.

For instance, the company will now require a wider breadth of knowledge in systems integration. "We're dealing with mission-critical systems, which require uptime," Murphy says. "These may be legacy computers moving to other systems as well. Companies are also employing intranet/Internet data warehousing. These things all bring us to the right place, at the right time."

According to Murphy, Advanced Systems Group is committed to the certification process that can ensure a customer of its expertise in such technologies. "It takes a lot of time from some very busy people, but it's important that we allocate the time to get people certified as soon as possible," he says.

Murphy believes that certification should be on most products as a subset of authorization. "Certain levels of certification can show a company's level of commitment to a product," he says. "In a systems product line like Sun's, it is mandatory to have certification levels to show your commitment to the product and solution."

In addition to its headquarters in Denver, the company also has offices in Salt Lake City, Phoenix and San Diego.

INTERVIEW WITH:

JOHN MURPHY
EXECUTIVE VICE PRESIDENT

Q: *Why is certification important to the potential customer?*

A: It provides them with a level of confidence. Some companies who don't know about reseller certification want to deal direct with the vendor. For example, there's still some hesitance in going a non-direct route. But we can alleviate their concerns by providing our level of certification with our expertise and training. Certification is a good way to show our customer that we are committed, and that we've undertaken an arduous process to gain that certification.

Q: *How much education is required to communicate that to the customer?*

A: It's important to educate the user. Certification in itself doesn't explain all that's involved; for example, the resources committed must be explained in fine granularity to really mean anything to the customer. We must show that this isn't some kind of run-of-the-mill certification you can get in the mail. We make sure that people know that certification isn't a minor detail, but is of great importance.

Q: *What are you doing with Java?*

A: We partner with providers like OpenConnect and we have engineering experience to support our customers who are using Java tools. We're investing in technologies and products that are based on Java, and training our engineers on migrating applications to a Java environment.

Q: *What do you see as the next critical IT shift?*

A: The thin client is just now coming about. There's been some major implementation and deployment, but it's still in the pilot stage. Systems management will also be important.

Q: *What effect will that have on you as a reseller?*

A: This shift will be a major move for us over the next several years. All these things require a greater level of expertise in open systems and enterprise computing, and that's where we're targeted.

BASIS

BASIS INC.
5758 Hollis Street
Emeryville, Calif. 94608-2514
(510) 547-5900 Home page: www.basisinc.com

BASIS, Inc. is a 15-year-old cross-industry systems integrator, serving clients in the telecommunications, healthcare, finance, retail, public utilities, state and local government, and high-tech fields. While clients are concentrated in California and the Pacific Northwest, the company has accounts throughout the U.S.

BASIS provides enterprise open systems integration and delivers Unix-based client/server solutions. Areas of expertise include database development, LAN and WAN products and services, the Internet and the World Wide Web, and custom software development.

BASIS has been a Sun reseller for nine years. The company is certified at the Enterprise Elite level to sell Sun enterprise hardware and software components, and is in the final stages of becoming certified for the Enterprise 10000 specialty. BASIS also has Specialty certification including Java, high availability/parallel database, and Sun Service Agent and Manager. President and CEO Pat Shanks also serves as president of Sun's Reseller Council.

BASIS has partnerships with other open systems companies. It is a Netscape Certified Commercial Applications Partner and a Netscape DevEdge Gold Partner. Other certifications include CA-Unicenter and Access Graphics' Consulting Partner Network.

The company is oriented toward enterprise-level sales. "More than two-thirds of our gross revenue over the last couple of years came from enterprise systems orders," says Michael Denney, vice president of marketing. "Some of our business comes from clients upgrading their mid-range system to high-end, high-availability server platforms," he adds, using an Internet site for travel services as an example.

According to Denney, the company's business is gravitating toward the enterprise level, "partly because of the availability of a product line that can address the needs of enterprise computing, and partly due to the growing robustness of the Solaris operating system. Companies are more willing to trust their mission-critical systems to these platforms," he says. "These are companies that can't have their systems going down."

INTERVIEW WITH:

MICHAEL DENNEY
VICE PRESIDENT, MARKETING

Q: *Why is certification important to the potential customer?*

A: Because, particularly in open systems, there is a theme of interoperable products and the range of choices is multiplied. Complexity is expanded accordingly. Integration has a vital role in mediating between choices and needs. The customer trusts us to help them determine appropriate needs and intersection of hardware and software.

Q: *Does the end user understand that message?*

A: I think so. Sun has had a certification process in place for several years, but just now is branding it and publicizing the importance of those credentials. Certification isn't the first thought or first word spoken by the potential customer, but we will surely help to make it so.

Q: *What are you doing with Java?*

A: Java is our meat and potatoes these days. We see Java as the answer to one of the most important challenges of open systems. You need runtime compatibility across heterogeneous platforms, and Java does that. It's a good language, and programmer productivity tools for it are coming rapidly. We are using Java in our Intranet applications, and have a number of different projects that are Java-based. Our own Intranet has been rewritten from a hodgepodge of code into Java and JavaScript.

Some of our most interesting early work with Java was for Sun itself. Last spring we built an event registration Web site for SunSoft to support an international training conference. It was dynamically presented in any of six languages, and included automatic mailback of course confirmations. We also built a multimedia document distribution intranet for SunSoft, heavily adapted from Netscape's Publishing System. Java-based enhancements included multi-level security controls and automated file prep and import procedures for the multimedia database.

Q: *What do you see as the next critical IT shift?*

A: The next IT shift will stem from the recognition that the enterprise fundamentally is the flow of all information. We see the notion of Information Distribution Networks to consolidate information in more central distribution points. We're seeing versions of this in today's data warehouses or data marts. We prefer the term "data lake" or "data reservoir," with flowing rivers as the metaphor. There will be engineering of data streams into that reservoir, and then the distribution of data in a meaningful way.

Central Design Systems, Inc.

CENTRAL DESIGN SYSTEMS, INC.
1705 Wyatt Drive
Santa Clara, Calif. 95054
(408) 327-9800 Home page: www.cendes.com

Central Design Systems. Inc. (CenDes) was formed three years ago to focus on the systems administration market. That same year, the company released its flagship product, LicenseTrack, to provide license management for Unix and PC network environments. The company also offers LicenseServ, a development toolkit for software developers who want to build licensing into their products.

A Sun Microsystems VAR since 1994, CenDes offers full hardware and software support, network and infrastructure development, local site and enterprise site management. CenDes supports Sun's enterprise and workgroup computing products and is certified to sell all Sun components. The company is certified up through the Enterprise Computing level.

President Bill Ames estimates that his company's business is currently 35% at the enterprise level and 65% at the workgroup level. This breakdown, he says, is typical for a company located in Silicon Valley because of the preponderance of workstations in E-CAD. "There is still a need for some large servers for the bigger jobs," he says. "In June alone we probably did about $1.3 million in just servers."

Like other Sun VARs, Ames reports that more of his company's business is moving towards the enterprise level. "In the systems administration market, a lot of business we see requires tools to make the job easier," he explains. "Sun traditionally provides good hardware, but when we go to sell a server we want to also sell the tools that will make life easier for the customer. We make sure we provide a full-featured suite."

Last year the company started an offshoot, Wyatt River Software, Inc., to focus on developing license management and software asset management solutions. Wyatt River is also based in Santa Clara and is now a separate company.

INTERVIEW WITH:

BILL AMES, PRESIDENT &
ROD MANN, EXECUTIVE VICE PRESIDENT (NOT PICTURED)

Q: *What is the difference between certification and authorization?*

A: Bill Ames: Authorization means that a company is allowed to sell a vendor's components and receive that vendor's services and support. In the case of Sun, certification means that there has been specific training for the products supported.

Q: *Why is certification important to the potential customer?*

A: Bill Ames: Certification makes it obvious that a company has more expertise. It means that we are able to sell a product and set it up. That we will be able to install the operating system. That we value-add technical support. These are things that keep the customer coming back.

Q: *What are you doing with Java?*

A: Rod Mann: We made a commitment to Java two years ago, before Java was cool. We "Javatized" our LicenseTrack product. We're announcing a new HTML-based version of LicenseTrack for Sun and NT, along with some other Unix platforms. We will migrate the pieces of the user interface into Java so eventually the entire UI will be Javatized.

We also released a 100% pure version of LicenseServ, our developer licensing toolkit. We're one of a handful of companies certified as 100% pure Java. In Sun's certification process this means that it is all written in Java, with no native interface calls. KeyLabs [a clearinghouse for Sun that certifies Java applications] verifies that your code is written in Java, and provides you with a script to test your code, and code coverage, for quality assurance.

Q: *What do you see as the next critical IT shift?*

A: Rod Mann: We see much of the world going back to the server. Client/server is great, but the management side was a headache. There is a significant cost in managing PCs.

With Network PCs and JavaStations, most of the work is done on the back end; the relevant piece is that the horsepower will be on the back end. We see a shift to more power to the servers. Most servers now are Sun boxes, and we're seeing high interest in using Unix as the server. NT is not suited to do scalable high volume work like Sun is. Also, most people tend to use E-mail the most out of all their applications. You can use the JavaStation, or a network computer, instead of a Windows PC, to do these things.

DIAMOND MICRO SOLUTIONS

DIAMOND MICRO SOLUTIONS
1515 Aurora Drive
San Leandro, Calif. 94577-3105
(510) 351-4700 Home page: www.dmscorp.com

Systems integrator Diamond Micro Solutions (DMS) was founded in 1982 to resell CP/M software. Eventually the company, originally named Diamond Software Supply, began selling PC-DOS applications to a corporate client base and moved into hardware when it picked up an IBM PC clone.

In the early 1990s the company took a look at the emerging Unix marketplace, and soon spun off a new division to focus on the open solutions marketplace. The Open Systems division integrated Sun-compatible software and hardware, including auxiliary disk and tape storage. In 1991 the company became a Sun Microsystems VAR.

Today DMS provides a suite of services, technology solutions and product fulfillment capabilities to a growing list of corporate clients, including Chevron, Ascend Communications, Bank of America, Genentech, Kaiser Aluminum, Shell Oil and Lucasfilm Ltd. The company delivers intranet/Internet, departmental and enterprise-level backup and recovery solutions, as well as high availability solutions. In short, it ensures that a customer has continued and immediate access to information.

"Our unique value-add is the cross-platform integration of various kinds of networks and different kinds of operating systems," says company president Rich Martini. Because of its experience in both PC and Unix operating environments, DMS can architect solutions that span across platforms. "This in turn helps our clients realize the maximum return on their technology investments," notes Martini.

The company is certified at the Enterprise Computing level, and, according to Martini, the company's business breaks down into 30% at the enterprise level and the balance at the workgroup level. The company's business is gravitating toward the enterprise level simply because that's the nature of the business problems customers have today, he notes.

Seven of Diamond's 35 employees have gone through the certification process, including salespeople and technicians. Martini doesn't complain about the certification process being tough, but then, from 1977 to 1981, he played in the NFL as a wide receiver for the Oakland Raiders and the New Orleans Saints.

INTERVIEW WITH:

RICH MARTINI
PRESIDENT

Q: *How hard is it getting users to grasp the message of certification?*

A: It requires an additional effort, not only on our part, but also on the part of the manufacturer. It's a shared responsibility. We can only do so much education in the channel. The manufacturer needs to take some responsibility in educating the end user in terms of what the different levels of certification of a channel partner mean.

Q: *What do you see as the next critical IT shift?*

A: It will be in the area of the Internet and Web and also Internet and E-commerce. There is a definite shift by many companies to move more of their work processes and communications processes, both internally and externally to the Internet. And they're implementing extranets to do the same thing—not only with customers but also suppliers.

Q: *What effect will that have on you as a reseller?*

A: Our job will be relating that shift, for corporate clients, to our ability to architect external extranets and internal intranets and consulting. It will be our responsibility to show them how to use Web-based technology to their advantage, and how to use it to work more efficiently with their suppliers.

Q: *How does being a reseller compare to playing in the NFL?*

A: Being a professional football player is intensely competitive. Each year I would compete with other individuals in training camp that were looking to win my job. It was critical to go out each day and perform at the highest level possible, with the most consistency possible. Good days and bad days were simply not possible.

The world of reselling is also very competitive. Customers demand the very best from us. Of course, the competition keeps our focus sharp, and keeps our team members performing at their very best in order to keep us differentiated in the eyes of the customer. In this environment, there are not many opportunities for second chances.

GATEWAY COMPUTER ASSOCIATES, INC.
11500 Ninth Street N., Suite 120
St. Petersburg, Fla. 33716
(813) 576-0549 Home page: www.gca.net

Gateway Computer Associates, Inc. was formed in 1987 to address customer needs in the CAD market. The company soon discovered that knowledge gained in learning how to move CAD files around could be leveraged in the networking market. The company now provides horizontal WAN/LAN, intranet/Internet, network management, network security, database management and business recovery solutions.

The company's Professional Services Division consults with the customer about problem discovery and then maps a route to the solutions. The company's mission is to provide technical solutions for business. "We're not out selling technology," said Anne Baum, company president and CEO. "We're selling a solution, with technology."

Six years ago, GCA started working with Sun Microsystems. The products it carries are primarily servers and enterprise servers, hardware and software, and Java solutions.

Gateway Computer Associates handles projects of up to $3 million. Its business mix is 60% enterprise and 40% workgroup. "More business is moving to the enterprise level," says Baum. "NT took away some of the workgroup areas, and Unix is migrating more and more to the enterprise. Our reaction to this trend is to have even more certification on expanded processes to proficiently handle enterprise-level projects."

INTERVIEW WITH:

ANNE BAUM
PRESIDENT & CEO

Q: *What is the difference between certification and authorization?*

A: Certification means that you know how to tie a solution into solving a problem, and that you know how to do the integration. Authorization means you know how to sign on the dotted line, to sell a product. It doesn't mean that you can solve a customer's problem, or that you accept responsibility for their company. A company can "buy" authorization. You need to demonstrate competency to be certified.

Q: *How well does the customer understand that message?*

A: They understand what certification means, but may not know the full extent of what it means to them. All manufacturers like to make things sound simple, but the savvy customer knows that education and competency are required.

Q: *Does certification pose any difficulties for you?*

A: Customers want to hire our highly trained, highly certified people for themselves. It's a challenge for us because we have to keep our people fulfilled so they won't be tempted to go to customer sites, where they could end up sitting in the same room doing the same tasks over and over again.

Q: *What are you doing with Java?*

A: We've incorporated Java into our enterprise computing strategy. We are designing custom Java applets for customer service intranets. We also find ourselves in the role of educator, showing the customer how Java can fit into their environment. A lot of people don't realize they have an alternative to PC applications. As customers evaluate the strategies and products based on total cost of ownership, Java is winning.

Q: *What do you see as the next critical IT shift?*

A: Examining the return on investment (ROI) of every piece of technology. In the past, technology was an expense in running a business. Now, the technology solution has to have a cost justification—an ROI—that answers the requirements of the business.

No longer is it technology for technology's sake. Every reseller has to know more, to bring more value to the customer, because ROI is the reseller's goal for their customer. It takes a partnership to make that ROI come true.

Network-Centric System Integrators

LANcomp

LANcomp
242 Old New Brunswick Road, Suite 200
Piscataway, N.J. 08854
(908) 981-1991 Home page: www.lancomp.com

LANcomp is a network-centric systems integrator whose mission is to design and implement open, IT business solutions for corporate clients. LANcomp works with customers to design a solution that embodies the network. The company focuses on five service areas: networking, security, video, business IT solutions and custom applications for enterprise deployment.

When working with a client, LANcomp first understands the business requirement, then helps the client map the best technology solutions to those requirements. Finally it helps design, implement and support that solution. A key component is "knowledge transfer," which occurs during all project implementations.

LANcomp is in the business of "resourcing IT" for clients, not outsourcing IT. The difference, according to Dan DeVenio, vice president of sales and marketing is that "the client is control of their IT strategy, which is a critical component of their future business success."

The company is certified at the Enterprise Elite level to sell the entire line of Sun hardware and software solutions, including the E10000. Most of the solutions that LANcomp provides involve the Ultra Enterprise Server line. The company also has several specialty certifications, including Java, security and high availability.

According to CEO Marc Surette, the hardest part about becoming Sun-certified is taking LANcomp salespeople and engineers out of the day-to-day business to get them trained to the level Sun wants. "But it's an investment," he says, "and it means that we are committed and in it for the long haul."

About 80% of the company's business mix is at the enterprise level and 20% is at the workgroup level, says DeVenio. More of the company's business is gravitating to the enterprise level, "especially in network-centric environments, where the use of the Internet, communications, etc., touch the entire enterprise," he says.

Serving the entire enterprise is easy with Sun products. "Sun's solution is not a disjointed product line," says DeVenio. "Sun provides an end-to-end, open systems approach with products that scale from the desktop to the server."

INTERVIEW WITH:

DAN DEVENIO, VICE PRESIDENT, SALES & MARKETING; MARC SURETTE, CEO & BILL MAGGIO, CTO

Q: *What is the difference between certification and authorization?*

A: Authorization means a company can sell a product. Certification means the company has passed stringent tests to sell and support a product. With certification there is much more investment in, and knowledge about, the products required. Sun certification clearly demonstrates that a reseller has systems engineers who are fully trained on Sun products.

Q: *Why is certification important to the potential customer?*

A: For customers dealing with a certified company, it provides a quality assurance level in the delivery of complete solutions.

Q: *What are you doing with Java?*

A: We are Java-certified. We've been using Java to enable Web sites to do video, and we're also using Java in some in-house systems. We have two or three pilots going now.

To bring the Java message to the customer, we've set up an internal demo center. Java is playing a big role in the enterprise, and we see people using Java to replace 3270 dumb terminals, particularly in the big insurance companies and financial services firms.

Q: *What do you see as the next critical IT shift?*

A: Integration of enterprise systems. More businesses in the middle market are expanding, and there is a need for companies to access information centrally.

Databases are being transformed for data warehouses; people are creating extranets, particularly in supply chain applications. All of this will ultimately require IT organizations to architect solutions that can rapidly meet the changing needs of their business environment. This translates to allowing user accessibility through Web browser integration that supports standard protocols and languages such as Java. The Web browser will become the user interface of choice.

Since this new architecture will also be more open than in the past, it will allow for rapid adoption of new technology, both hardware and software, that will be accessible through the total enterprise. Some companies, particularly mid-sized ones, don't have the IT staff to handle all this. They can leverage our knowledge to help them implement the changes.

Peripheral Vision InfoSystems

"We Put the Future In Focus"

PERIPHERAL VISION INFOSYSTEMS, INC.
7211 W. 98th Terrace, Suite 120
Overland Park, Kansas 66212-2257
(913) 341-7881 Home page: www.pvii.com

Founded in 1987, Peripheral Vision InfoSystems, Inc. (PVII) is a privately-held, full-service systems integrator specializing in enterprise computing and open systems migration and deployment. PVII provides consulting, integration and training for network security and management, Internet, intranet and extranet services, database design, development and administration and custom Unix/Java programming.

The company is certified at the Enterprise Elite level. Its business is 60% at the enterprise level and 40% at the workgroup level. "We always expected our business to gravitate toward the enterprise," says CEO Scott Kane. "That's one of the reasons [we became a Sun VAR]. We came from a mini (DEC VAX) background, and Sun was uniquely positioned to carry SMP and 'the network is the computer' to the enterprise. There is still a strong foothold in the workgroup level for Sun, but more opportunity is at the enterprise level."

The company also has a strong focus on Java. It is involved in projects for data entry or airline reservation applications, where dumb terminals are replaced by thin client Javastations. "We have a lot of companies with aging applications running on minis," says Kane. "They do a good job with text information and remote locations. The administrator can control this from a central point. But a company may need to keep all of this up and running while expanding their business resource requirements.

"In this environment," he notes, "we can increase the ability to handle more users, and add E-mail, collaboration and Intranet features, as well as some new applications. The company can keep central control while adding these new production pieces."

The company also uses Java is to help build a third tier that sits between the client/server applications. PVII will put in an Oracle or SQL database, feed mainframe data to the SQL server, then push that data through a Web server to provide HTML and Java to a browser-based client. "We maintain the core process on the mainframe, but deliver through the Web paradigm" to solve issues such as low-cost centralized administration and software distribution, says Kane.

INTERVIEW WITH:

SCOT KANE

CEO

Q: *How important is it to you to be Sun-certified?*

A: When we talk about certification, I don't think there is any better example than what Sun has done. Sun has a core competency, and a requirement to maintain that level of competency. This requires extensive training and proficiency exams. Certification doesn't mean that you simply arrive at a level and that's that. You're certified that you have mastered the technology, and that you can maintain your level as the market changes.

Q: *Why is certification important to the potential customer?*

A: They need to know we have proficiency. The whole phenomenon of open systems scares a lot of people because it requires the introduction of a lot of components they're not familiar with. We can help them leverage what they've already got.

We feel that solutions are 30% technology, and 70% is applying the technologies and the client feeling comfortable with it. The customer will have more confidence in us because we know the products we are selling and we master them, and the manufacturer endorses us. We feel that Sun is a partner with us in applying the technology to the client's business set.

Q: *What's the next critical IT shift? What effect will that have on you as a reseller?*

A: With the Web paradigm and open systems, companies will be able to tie their islands of information together. An important component for most companies will be centralized processing and data warehousing. We see people using fewer boxes to do diverse processing. Data shops will take on a new way of managing and allocating resources.

With the open enterprise philosophy, things will be more complex. Mainframes are running out of speed and becoming more costly to operate. Databases are also growing at a dramatic rate, with some of the largest now in excess of a terabyte in size. Clients need more processing power, and distributed services require centralized administration. A lot of companies have oversized, underutilized resources in some areas.

We believe that reliability, availability and serviceability (RAS) will allow Sun enterprise servers more access into the mainframe space. Manageability, flexibility and uptime are all required. This is a complex shift.

SOLID SYSTEMS, INC.
5610 Guhn Road
Houston, Texas 77040
(713) 895-0500 Home page: www.solidsys.com

Solid Systems, Inc. was founded in 1983 to provide high-end technical services for the IT environment. By 1990, Solid Systems had initiated an agreement with Sun Microsystems. Soon after that, the company became a Sun VAR and released an enterprise-wide automated backup product for lights-out operations.

Since then, the company has far exceeded its business expectations with Sun and has grown to become one of Sun's largest VARs.

Today, Solid Systems specializes in enterprise information management with a focus on networking. High-end services remain an integral part of the company's business. The firm's expertise in high-end networking complements its work with Sun products and provides for end-to-end management of the enterprise. The company employs 85 people, and maintains a ratio of two technical people per each salesperson.

Solid Systems is certified to sell the entire Sun line, from the desktop up to the E6000, along with all SunSoft products. The company is in the process of attaining the E10000 specialty certification. It is also certified in all post-sales services and maintains a Sun-certified help desk.

The company's business mix is changing. Two years ago, it sold 70% to workgroup and 30% to enterprise, but according to director of marketing Warren Barnhart, 40% of the business is currently at the workgroup and 60% is at the enterprise level.

INTERVIEW WITH:

WARREN BARNHART
DIRECTOR OF MARKETING

Q: *What is the difference between certification and authorization?*

A: Certification requires a lot more training and knowledge. To me, this is a level above, like hiring a CPA as opposed to hiring an accountant. We're working to ensure that our customers understand this.

Q: *Why is certification important to the potential customer?*

A: When they buy from us, the certification ensures that our people are knowledgeable and that we will provide higher quality configuration and services. Sun continually raises these requirements, and we continually work to stay on top of that.

Q: *Do end users understand this message?*

A: Some do. To new users, certification doesn't always matter. In larger businesses, with larger projects, certification means a lot to them. They know we are knowledgeable, and they need that because they don't want problems.

Q: *How time-intensive is the process of becoming Sun-certified?*

A: We provided 100 man-weeks in technical training last year. This is taken out of our business, but we believe this is worth the investment, even though while people are in training, they aren't out there selling or doing presentations.

Q: *What do you see as the next critical IT shift, and what effect will it have on you as a reseller?*

A: Applications based on Java will cause a major shift in the IT environment. We are developing packages based on Java, and we have one product that has gone into beta testing.

TECHNOLOGY APPLICATIONS INCORPORATED

TECHNOLOGY APPLICATIONS, INC.
17 Research Park Drive
St. Charles, Missouri 63304
(314) 916-7000 Home page: www.techapp.com

Technology Applications Inc. is a software engineering and systems integration company. It specializes in the development of customer care and billing software aimed at the telecommunications industry, as well as strategic IT consulting for Fortune 1000 companies throughout the Midwest.

Founded in 1992, TAI initially worked with clients to develop department-level and enterprise-wide systems and software applications for the data warehouse, security and networking markets. The company began on a VAR model, with Sun hardware and software solutions and third-party software written for Sun systems.

To that mix the company added the development of custom client solutions using emerging Internet technologies and products. As the Internet market grew, TAI saw tremendous potential for IT consulting and a complete Internet access, customer care and billing solution for telecommunications companies and Internet service providers.

TAI launched its first product, the Internet Provider Access Controller (IPAC) 9000, in 1995. It is targeted at the access provider segment of the Internet market. In 1996, the company introduced CIM (Customer Information Management), a customer care and billing solution.

Products are available from two divisions. The Enterprise Consulting (EC) division offers custom solutions for F500 companies in the central U.S. The Internet Systems & Technologies division (IS&T) targets the Internet segment of the communications industry.

TAI sells all Sun hardware and software components and is certified at the Enterprise Elite level. The company mostly works at the enterprise level. "A company's database must be accessible by the entire company; it's not just workgroup-specific," says Keith Wolters, director of marketing. "To address the entire enterprise you have to be able to work at all levels, so it's not a matter of half my company being workgroup-certified and half being enterprise-certified."

Projects will always be a mix of enterprise and workgroup levels, says Wolters. "Some companies do a bottom-up approach, while some more visionary companies will have us bid on an entire Sun solution.

"A lot also depends on where a company is with its relationship with Sun. If the company needs to make its first inroad, they may start at the workgroup level and work up to enterprise level."

INTERVIEW WITH:

KEITH WOLTERS
DIRECTOR OF MARKETING

Q: *What is the difference between certification and authorization?*

A: Authorization means that you can sell a product, but you don't have to know how it works. Certification is a process implemented by Sun which includes rigorous training, and means that we're certified to be competent in selling, supporting and maintaining Sun software and hardware.

Q: *Why is certification important to the potential customer?*

A: Certification tells our customer that we've made an investment in our people. That shows a company considering doing business with us that we view the relationship as more than a "here's the box, see you later" deal. It means we're in this for the long haul, and there's a true partnership between the customer and us. It means that we can do what we say we can do. This gives the customer that warm fuzzy feeling that keeps them coming back to us.

Q: *Does the user understand that message, or does that require an educational effort?*

A: Those who are Sun-literate understand the implications of the certification process. Those who are just starting to go to Sun need more education and typically they look for more information from Sun. We often educate them, but this is a one-time process.

Q: *What are you doing with Java?*

A: We've already written several very large applications. These are 100% Java-based applications, exceeding 200,000 lines of code. The next generation of our product will be in Java. We endorse Java; our company is a strong believer in its future and applicability in corporate America.

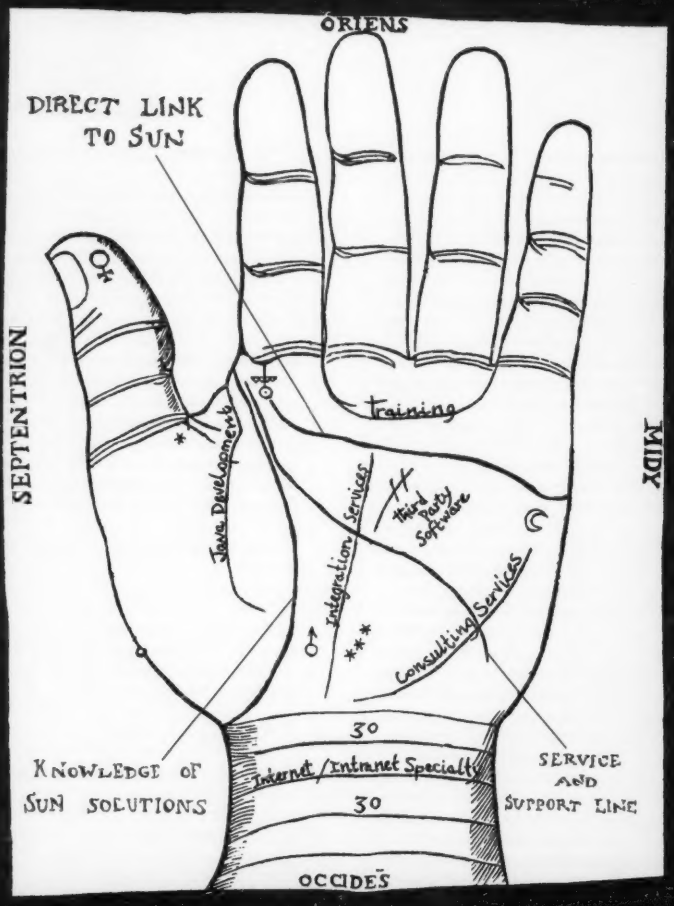
Q: *What do you see as the next critical IT shift?*

A: The concept of an OS-less machine, the network computer (NC). Corporate America doesn't seem to have fully embraced this yet. Still, the concept is making inroads.

There will be a big battle between NCs and Microsoft/Intel machines. I believe both could end up claiming victory. The concept will evolve more readily over the next few years, and the battle for the device and the OS will heat up.

What this means is that we will need people certified in the new paradigm. It doesn't change our model, but it changes the tools in our doctor's bag. Our support will be needed even more.

Your future is in your hand.



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Sun microsystems

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Briefs

E-mail anywhere

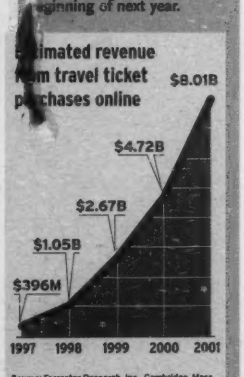
IPlanet, Inc. in Sunnyvale, Calif., is shipping Pony-Espresso, a World Wide Web browser add-on for accessing electronic mail from the road. With a Java-enabled browser, Pony Espresso users can send E-mail securely from any Internet-connected client. Pony-Espresso supports the Secure Sockets Layer, a protocol that allows mail to pass safely through a Web server. Pricing is $795 for up to 10 users and $2,995 for unlimited users.

Pegasus updates travel

Pegasus Systems, Inc. in Dallas last week rolled out changes to its TravelWeb travel-booking Web site. The changes include an interactive map to show users where hotels are located and a search engine for airfares to let its customers search by price, class of service, seat selection or other criteria.

Bell Canada does EDI

Canada's biggest regional telecommunications operating company, Bell Canada, signed a deal with Actra Business Systems LLC to use Actra's electronic data interchange (EDI) systems to build an Internet-based business-to-business electronic-commerce network that spans the Great White North. Actra is a joint venture between Netscape Communications Corp. and General Electric Co. The services will be available by the beginning of next year.



User/IS team grows extranet

▸ *Programmer, biologist team up for customers*

By Carol Sliwa

CHARLES RIVER LABORATORIES, Inc., the world's largest producer of laboratory animals, has massive quantities of data stored around the world.

What the Wilmington, Mass., company doesn't have is an army of programmers to write applications that can extract that information and make it usable via intranets and extranets by its 1,800 employees and hundreds of customers.

In fact, the task of writing the intranet/extranet application fell to just two Charles River employees. One, Mark Cerra, is a programmer by trade. The other, William Shek, is a veterinary microbiologist with no formal training in computer science but a keen interest in the technology "borne of necessity," as he put it.

The teaming works well, they said. Cerra, a manager of scientific programming at Charles River, has the technology background, and Shek, director of diagnostic servers, knows the scientific needs of the company's commercial testing labs.

For the past dozen years, they have worked on a variety of applications that help organize and manage the process of receiving animal and serum samples, testing them and reporting the results.

They even automated part of the process after the 1989 purchase of a robot.

Their lab information systems let internal workers share over leased lines data stored in AS/400 databases. But customers had to submit test requests and get results by fax or mail. Customers, such as pharmaceutical companies, either purchase disease-free animals from Charles River and ask the company to perform specific tests on them or send samples they want tested.

PHOTOS BY CAROL SLIWA

William Shek (above) and Mark Cerra worked together to develop Charles River Labs' extranet

Shek originally considered developing a PC application that would let customers send in floppy disks that contain descriptions of the animal or serum sample they were submitting and the tests they wanted done.

But the advent of extranets raised the possibility that Charles River could let customers communicate with the company in an easier way. Employees at Charles River's plants and labs around the world also would reap the benefits, gaining the ability to post results to a

Extranet, page 50

Sites don't toe the bottom line

▸ *Factors other than profits fuel drive to Web*

By Patrick Thibodeau

CLEARLY CANADIAN BEVERAGE Corp. didn't create a corporate Web site to make money. It wanted something that has become nearly as indispensible as profits: a presence on the World Wide Web.

But the lack of financial payback made some senior managers at Vancouver-based Clearly Canadian wonder if it was worth it.

"We had to get a consensus of our senior managers, some of whom haven't been actively involved in the rise of the 'net," said Kelly Lendvoy, who spearheaded the Web effort at Clearly Canadian. The recently launched Web site cost $50,000 to develop.

IMAGE CONSCIOUS

"I don't think our corporate site is going to sell more Clearly Canadian immediately, but my job is to establish and maintain relationships with important audiences," said Lendvoy, who is also director of corporate communications.

Lendvoy isn't alone. "We would be remiss to think that the Web site would bring us tremendous business volume," said Tom O'Donohoe, who led a Web site project at Redwood Systems, Inc. in Menlo Park, Calif., a transportation logistics outsourcer that was formed in January. The Web site, which went up several weeks ago, "is a very effective and cost-effective way to basically introduce our company to the world," he said.

Corporate Web sites that provide information about products, financial statements and press releases are the norm today. Among Fortune 1,000 companies, 80% to 85% have a Web presence, according to Gartner Group, Inc. in Stamford, Conn. "If I call you and you don't have voice mail, I think you're really out of it," said Gartner analyst Geri Spiler. The same perception applies to Web sites, she said.

But corporate Web sites aren't income producers. "Expectations should be [that] it's there to maintain contact and provide a base for new people to start gaining contact with your company. There shouldn't be an expectation of monetary gain," said Harry Fenik, an analyst at Zona Research, Inc. in Redwood City, Calif.

Despite the hundreds of corporate role models on the Web, neither Clearly Canadian nor Redwood — both relative latecomers to the Web — used a cookie-cutter approach to creating a Web site. Officials at both

Web sites, page 50

Service gives extranet host more control

By Mitch Wagner

GENERAL ELECTRIC Information Systems, Inc. (GEIS) last week rolled out a new version of its extranet hosting service designed to let companies use Internet technology to build private trading communities among business partners.

GE InterBusiness Partner 2.0 provides companies with greater ability to customize their World Wide Web sites for individual users. The system, based on Netscape Communications Corp.'s SuiteSpot 3.1, lets companies set up individual logins for each business partner. It also controls on a page-by-page basis which areas of a site and what kinds of information each business partner can access.

GEIS is one of many companies that offer Web hosting services, including all the major Internet service providers and telephone companies. The GEIS

GEIS, page 50

THE PAPER AND INK USED IN THE ORIGINAL PUBLICATION MAY AFFECT THE QUALITY OF THE MICROFORM EDITION.

Sites often don't toe bottom line

CONTINUED FROM PAGE 49

companies said they struggled with myriad design and content issues, with the goal of making their Web sites as engaging as a well-plotted story.

Redwood Systems, for instance, wanted a Web site that was user-friendly, direct and simple. It decided to eliminate as much as possible the need to scroll or click another line.

NO TIME FOR SCROLLING

"Our target audience are senior-level people in corporate America, and we felt that they didn't have the patience or the time to be scrolling or jumping around," O'Donohoe said. Redwood Systems' Web site cost $15,000 to develop.

For its part, Du Pont Photomasks, Inc. — which was spun off last year from Du Pont Co. — wanted to use the Web to help establish a separate identity for itself, said Tom Blake, senior product marketing manager.

The Round Rock, Texas-based company also wanted a Web site that appealed to a broad audience, which encompasses everyone from customers to people with interest in the company. "Probably the biggest challenge that we had was that we had too much information to put on the site. We really had to focus on the right type of information as well as the right amount," Blake said.

IS NEEDS A ROLE

Many companies hire outside designers to create Web sites, and most Web design projects — 75% of them, according to a Gartner study — are driven by a company's marketing department. But information systems leaders should have a role in Web site creation.

"IT needs to continue to move toward the marketer's mind-set and vice versa," said Chip Perry, senior MIS director of information strategy at food manufacturer Pillsbury Co. in Minneapolis. "There needs to be a partnership from day one."

"The opportunity for both groups to partner offers big leverage in terms of mutual learning and creatively developing new ideas together," Perry said. "The insights of one group will feed the other." □

NEW PRODUCTS

SYMANTEC CORP. has announced Visual Page for Windows 95 and Windows NT 4.0, a Hypertext Markup Language editor for World Wide Web page design.

According to the Cupertino, Calif., company, the software includes a standard tool bar, professional templates, tutorials and autosizing capability. The tool also supports Java applets, plug-ins from Netscape Communications Corp. and embedded video.

Visual Page for Windows 95 and NT 4.0 costs $79.95.

Symantec
(541) 334-6054
www.symantec.com

SHOWBASE, INC. has announced ShowBase Extra Version 2.0, software to publish databases directly to the World Wide Web or a corporate intranet.

According to the Aylmer, Quebec, company, the wizard-driven database migration tool supports more than 40 database packages and runs on 15 Web server platforms. It enables users to create their own search interface using any word processing program with the ability to save in Hypertext Markup Language format.

Pricing ranges from $1,499 to $4,499, depending on the platform.

ShowBase
(819) 685-2273
www.showbase.com

CE SOFTWARE, INC. has announced QuickMail Office, an electronic-mail package for small and midsize businesses and workgroups.

According to the West Des Moines, Iowa, company, the software is comprised of QuickMail Pro client software for Windows and the Macintosh and a Post Office Protocol-3 E-mail server that runs on Windows 95 or Windows NT. It features a built-in spell checker, automatic mail management, encoding for attachments, mailing list capabilities and an E-mail on-demand feature.

Pricing starts at $379.95 for five users.

CE Software
(515) 221-1801
www.cesoft.com

PERSEUS DEVELOPMENT CORP. has announced SurveySolutions, a Web-based version of its survey design and analysis software.

The Braintree, Mass., company said application wizards help users create questionnaires in a word processor, post them to the World Wide Web or distribute them using electronic mail. They also automatically collect responses in a database, analyze the results and quickly produce presentations.

SurveySolutions costs $149.

Perseus Development
(781) 848-8100
www.perseusdevelopment.com

BLUE LOBSTER SOFTWARE, INC. has announced the Stingray 3270 Software Development Kit (SDK), software that enables connectivity between Java clients and mainframe data.

According to the Rochester, N.Y., company, the software creates Java-based applets that communicate with mainframe applications using terminal emulation from any Java-supporting platform. Stingray records host sessions, converts them to Java code and creates Java-based applications that directly access and run legacy data across the World Wide Web.

The Stingray 3270 SDK costs $395 until Sept. 30, after which it will cost $795.

Blue Lobster Software
(716) 546-3550
www.bluelobster.com

WBT SYSTEMS, INC. has announced TopClass Server 2.0, a cross-platform, World Wide Web-based interactive training software for Windows, Macintosh and Unix systems.

According to the San Francisco company, the software is a server-side application designed to facilitate the creation, management and secure delivery of training programs that users access through Web browsers. It includes electronic mail, customized course pages, discussion-group facilities, automated testing features and summary reports on student performance.

Pricing starts at $1,295 for 25 users.

WBT Systems
(415) 487-2250

User/IS team grows extranet

CONTINUED FROM PAGE 49

central database.

"All of a sudden, everyone realized we could not just show pictures on the Internet but really do business," Shek said.

When the extranet is up and running by the end of the year, customers will need a password, customer identification code and individual code to access a form that will let them tell Charles River which samples they want tested and request results.

DATABASE OVER MAINFRAME

The need for speed during the development process prompted Charles River to use Microsoft Corp.'s SQL Server database for data storage.

"It would be great to store data on the mainframe because no one doubts the mainframe computer is more stable than a PC," Shek said. "But we believed it would be easier to do rapid application development using SQL Server."

And rather than use the Windows-centric Visual Basic to develop the user interface, the company will use Java because "it's now become clear that for the Internet, if you want to make applications that anyone can access, regardless of what kind of system they have, it has to be in Java," Shek said.

Shek and Cerra are in the process of learning Java, so they can't really write the code themselves. Instead, they use a tool called JADE from Vision Software Tools, Inc. in Oakland, Calif. Shek said he likes the tool, particularly because it lets him quickly write scalable applications that are rules-based, so they don't have to write a lot of code to access information stored in the database.

"The more efficient we are, the better we can treat our employees and customers," Shek said. He said they are trying to be entrepreneurial rather than "study everything to death."

"The real benefit is not how much money we save," Cerra said. "It's how much more business we generate." □

GEIS extranet offers control

CONTINUED FROM PAGE 49

offering differs because it also offers extensive custom coding to connect a Web site to back-end applications, such as mainframe software, order-fulfillment applications and inventory applications, said Guy Fisher, manager of messaging solutions at GEIS. Major competitors to the GEIS offering include big systems integrators, such as IBM and Electronic Data Systems Corp., as well as smaller specialty integrators such as Cambridge Technology Partners, Inc. in Cambridge, Mass.

Combining Web hosting with outsourcing services such as the development of interfaces to back-end data solves a big problem for users setting up extranets, said Chris Stevens, an analyst at Aberdeen Group, Inc. in Boston.

"In extranets and intranets, the pieces that are flaky and haven't worked very well are the integration with existing systems," Stevens said. "You can host the site externally — they run the hardware and amortize the cost of the hardware — but then you still have to do the systems integration elsewhere."

But Richard Warren, vice president of information services at Judd's, Inc., a large printer in Strasburg, Va., said he was skeptical. He said the GEIS service might appeal to GEIS's existing user base but not to other users. Web hosting and creating connections to back-end applications are done fairly easily, he said.

"Running a Web site and controlling access to the Web site is a fairly primitive and rudimentary capability," Warren said. "Back-end capability is getting easier by the moment. They have managed to offer a combination of services [so] that it's easy enough for end users to do themselves." □

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Advanced Systems Group, Inc.

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Diamond Micro Solutions

Basis, Inc.

Workgroup Computing Certified

Acclaim Technology, Inc.

Advanced Information Systems Group

Bay State Computer Group

CIC Systems

Great River Systems

New Logic, Inc.

Personal Workstations, Inc.

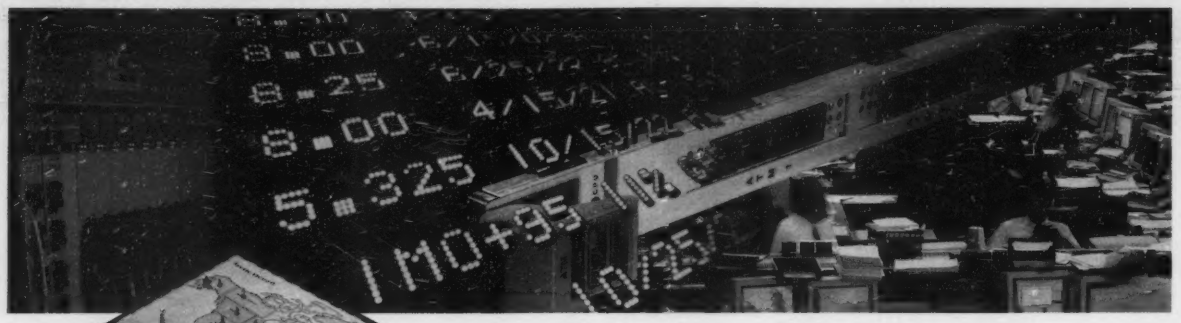
StorNet

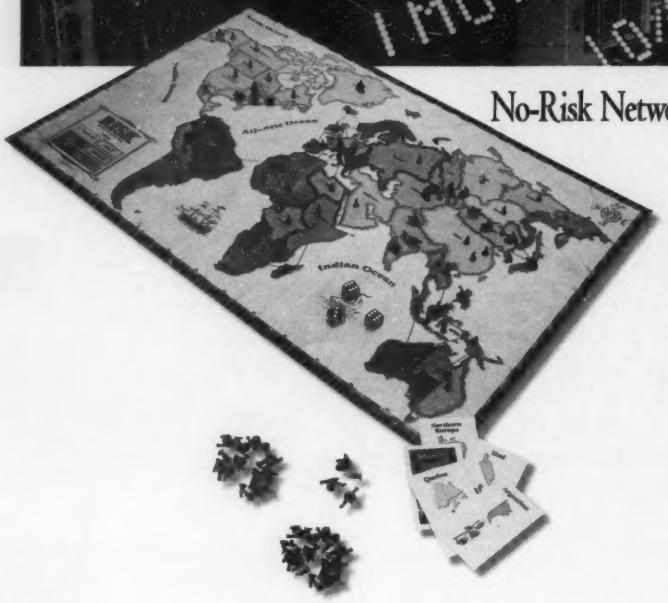
Technical Solutions, Inc.

World Wide Technology, Inc.

Look for more information on these resellers and their winning ideas in the Sun Certification Innovators Contest supplement on this issue's cover.

Remember when owning a strategic network didn't have to cost you the world? We do.





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The Enterprise Network

LANs ♦ WANs ♦ Network Management

Briefs

HP expanding monitor

By month's end, Hewlett-Packard Co. expects to ship NetMetrix 5.0, software for monitoring and reporting network performance. It gathers LAN statistics to show what is driving WAN use. Pricing starts at $5,995.

Bandwidth booster

Torrent Networking Technologies Corp. in Landover, Md., last week announced its IP9000 Gigabit Routers to scale user and Internet service provider backbones to higher speeds. The boxes can handle voice, data and video simultaneously. They will be out by year's end. Pricing hasn't been set.

Point and configure

Start-up Netstation Corp. in Research Triangle Park, N.C., has announced a World Wide Web-based network and configuration tool to help managers control routers and switches. Through its Java-based graphical interface and central database, Network Configurator automates the deployment or update of these devices and validates settings. Pricing starts at $15,000.

NO SECURITY GUARDS

Network security remains an oxymoron for many organizations, according to a recent survey of 4,226 large and midsize companies:

45% report definite or suspected breaches in their Internet security

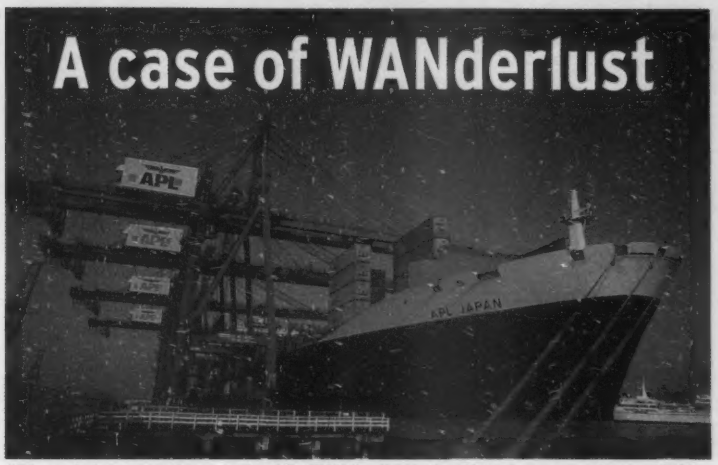
43% don't regularly monitor their networks for break-ins

20% lack formal security policies

49% of those that report a security violation haven't installed a firewall

Source: Ernst & Young LLP, New York

A case of WANderlust



APL needed an accurate analysis of its WAN for timely tracking of cargo moving worldwide

▸ *Shipping group realizes financial gain by monitoring network activity*

By Patrick Dryden

INSTINCT ALONE no longer suffices for IS managers who must nurture networks under pressure from client/server changes, cost controls and constant competition.

For example, American President Lines Ltd. (APL) struggled nearly a year after launching a network-analysis project to get the facts about activity on the vital wide-area network that supports its container transportation service. With its facts straight, the company is saving thousands by upgrading — and sometimes downgrading — to optimize performance.

TRAFFIC JAM

APL built a global WAN four years ago so users worldwide could reach mainframe data, share files and exchange electronic mail. But soon, more sophisticated applications for sales automation and cargo tracking gobbled up precious bandwidth.

"We were always flying blind," said John Anderson, vice president of telecommunications and computing services at APL in Oakland, Calif.

Specifically, information systems staffers could never understand utilization of its routed TCP/IP connections or determine upgrade needs, Anderson said.

Bottlenecks lurked throughout the WAN, and improvements were costly gambles.

APL, page 54

Microsoft launches enterprise NT

By Laura DiDio

MICROSOFT CORP. last week released its Windows NT Enterprise Edition 4.0 just in time for its Professional Developers Conference and just under the wire for its promised summer ship date.

At a list price of $3,999 for a 25-user license, the Enterprise Edition costs more than double the $1,468 that businesses now pay for a standard version of Windows NT 4.0.

Windows NT Enterprise Edition 4.0 is overkill for those who use run-of-the-mill apps.

For their money, users get built-in, two-way failover clustering support to ensure 100% network uptime; support for 3G bytes of memory compared with the standard 2G bytes in Windows NT 4.0; and the option to run NT on servers with up to eight symmetrical multiprocessors,

Microsoft, page 54

Cisco preps Web-based management

By Bob Wallace

CISCO SYSTEMS, INC. is developing Web-based network management software that is cheaper and easier to use than traditional platform-based systems.

Cisco last week detailed its Assured Network Services initiative, which calls for integrated devices, policy-based networks and service-level management applications. Products are due starting next month.

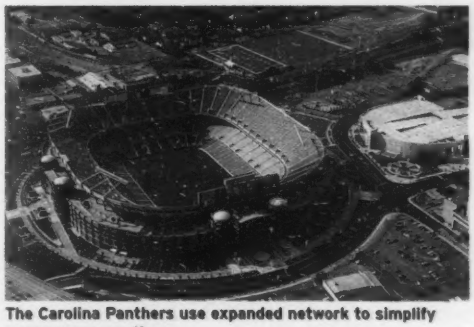
Cisco officials said the programs will dramatically reduce the complexity and costs associ-

Cisco, page 56

LAN blitz sharpens Panthers' claws

▸ *Expansion team builds net from the ground up*

By Bob Wallace



The Carolina Panthers use expanded network to simplify pregame preparations

THE CAROLINA PANTHERS have gone from National Football League expansion team to playoff power in just two seasons — helped at least in part by a network that is compact but powerful.

The network has been expanded from one LAN segment to a 100M bit/sec. backbone with WAN links.

And the team's IS staff hopes the benefits of the network will be showcased this evening when the Panthers battle division rival San Francisco 49ers on *Monday Night Football* at the Panthers' home, Ericsson Field in Charlotte, N.C.

Preparation would have been tough if Roger Goss, MIS manager for the Panthers, hadn't decided to install switching from Xylan Corp. to provide the team's staff high-speed access to information on servers from four vendors.

Panthers, page 54

LAN helps Panthers keep claws sharp

CONTINUED FROM PAGE 53

"We needed that because the coaches create complex graphics, like playbook diagrams and game plans, and download them from servers to workstations," Goss said.

"We wanted to keep the network flat and simple," he said.

It now has 83 users, split between 10M and 100M bit/sec. LAN segments, but with 100M bit/sec. links from switches to servers.

In the $500,000 project, Goss tied multiple switches together using a 100M bit/sec. Fiber Distributed Data Interface backbone.

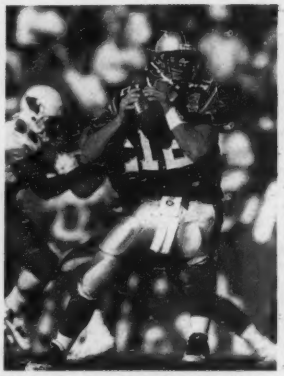
"It's quite unusual to hear of such a small but high-powered network," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy that specializes in networking.

"It's clearly the graphics and some of the technologies they're looking at that have driven the need for the speed," Briere said.

NO REQUIREMENTS

There was no requirement to sell management on the project, Goss said.

"I'm given authority to do what I think should be done and am held accountable," he explained.



Coaches share scouting reports, to set up Panther plans of attack

The Panthers also needed a frame-relay link to other teams and to the NFL office for electronic mail, and to keep the league apprised of its waiver wire moves.

If the Panthers pick up a player on the wire but don't notify the league within a certain deadline or time frame the deal would be canceled, Goss said.

VIDEO SWITCH

The Panthers are very interested in digitized video, which would allow them to more easily share game films with other teams.

"We made the move to switching in part to have the infrastructure to handle this once the league finalizes a plan for it," Goss said.

"You have to have a solid infrastructure before you can think about digitized video," Briere said.

The network is taxed most heavily from Mondays to Wednesdays; on those days, the Panther coaches produce and distribute game plans, updated playbooks and other items in preparation for the next week's game.

"That's also when our staff sends in their scouting reports for the next opponent, and they are pulled into the process," Goss said. □

APL keeps close tabs on WAN

CONTINUED FROM PAGE 53

As a result, slow connections for users and customers hurt APL's ability to compete in the shipping world, said Ramona Cuevas, senior manager of planning and engineering. Her task was to reveal current and historical shipping trends, predict the impact of new client/server applications and design the network that will result from APL's expected merger with Neptune Orient Lines in Singapore.

The biggest roadblock was "putting the analysis project on the back burner when other priorities came up."

– Ramona Cuevas, APL

Instead of piecing together performance data from several tools, APL opted for an integrated suite of analysis and simulation software from Make Systems, Inc. in Mountain View, Calif.

DISAPPEARING HELP

Applying that complex software required a week's training for two full-time, special operators, Cuevas said.

"They must have a very analytical mind, be organized and process-oriented, and a little creative," she said. Last month, one operator took this new skill elsewhere, a common problem for every IS group.

APL didn't actually benefit from the Make Systems tools until about nine months after it adopted them, Cuevas said.

Besides the time needed to understand and implement the software, the company had to wait for performance data to accrue so the software could run accurate simulations and make predictions. The biggest roadblock, though, was "putting the analysis project on the back burner when other priorities came up," Cuevas said.

That was a big mistake in hindsight, now that APL can better manage its WAN through accurate measurements, Cuevas said. The Make Systems suite would have paid for itself sooner, she said.

NetMaker XA costs from $7,000 to $15,000 per tool, plus special plug-in modules that cost between $1,500 and $9,500. When budgeting for the WAN, IS can examine actual utilization and forecast real needs "instead of throwing bandwidth at problems and going on gut feelings," Cuevas said. For example, APL saved money by reducing an underused T1 link to 56K bit/sec.

By pinpointing a design flaw in one key application that "brought the network to its knees during the busiest part of the day," APL prevented doubling another link's speed at a cost of $5,000 per month, Cuevas said. □

Microsoft

CONTINUED FROM PAGE 53

rather than a maximum of four processors.

The product is overkill for those who use run-of-the-mill applications, but it could be important for leading-edge users such as banks or brokerages that run resource-intensive applications and need fault tolerance even for applications that don't run on high-end Unix servers, said Neil Macdonald, an analyst at Gartner Group, Inc. in Stamford, Conn.

Andy Doran, MIS manager at PMP Corporate Systems Ltd. in London, said eight-way processing and built-in fail-over will more than pay for themselves if the network goes down.

"The cost of lost data is incalculable, so we're not complaining about pricing," he said.

But Jeff Dazell, LAN administrator of network services for corporate support at Dana Corp., said he doesn't need the advanced functionality right now.

The $7 billion automotive parts company in Toledo, Ohio, has 45,000 users on the network.

"We can't make a business case for switching to the Windows NT Enterprise Edition now. It's for people who need extreme multiprocessing capabilities, and that's not us," he said.

Dazell also said he is hesitant about being the first to install newly released operating system software.

He is especially leery, he said, because Microsoft has had to ship multiple patches for its Windows NT Service Pack 4.0 update. "That's unconscionable. For the amount of money we're paying [for Windows NT], it should be perfect. The way things are now we can't put software into production until after we've tested it two to four months," Dazell said.

Bill Weyrick, manager of user support and network services at Dartmouth Hitchcock Medical Center in Lebanon, N.H., which has about 10,000 users, said he is interested in the NT Enterprise Edition but will "review it a bit more" before making a final decision.

"We want lower pricing across the board on Windows and Windows NT products. We are considering it because we need the power and redundancy of the clustering, but we won't install it right away," Weyrick said.

"For the amount of money we're paying [for Windows NT], it should be perfect. The way things are now, we can't put software into production until after we've tested it two to four months."

– Jeff Dazell, Dana Corp.

Jim Clark, a consulting systems engineer at a large California bank with 60,000 Windows NT users, has beta-tested Windows NT Enterprise Edition for the past several months and likes the advanced functionality. Clark said he expects the street price to be about 35% below list price, which would make the purchase less painful.

Clark said the bank is weighing the price premiums of the Microsoft Enterprise software packages against the benefits of guaranteed 100% uptime.

"The 100% uptime will win out," Clark predicted.

The clustering capability should help the bank minimize costs by running applications on both servers to maximize operations, he said.

"If the networks are down for any reason, our business stops." Clark said. "We're not penny-wise and pound-foolish." □

SHORTS

Monitoring tool

Start-up WinVista Corp. in Boca Raton, Fla., recently introduced a reporting tool that can tell managers what programs, Web sites and files users are accessing. Besides employee monitoring, WinVista Pro can let trainers or the help desk find out where users have trouble running an application by tracking their time and keystrokes. WinVista Pro starts at $100 per Windows station.

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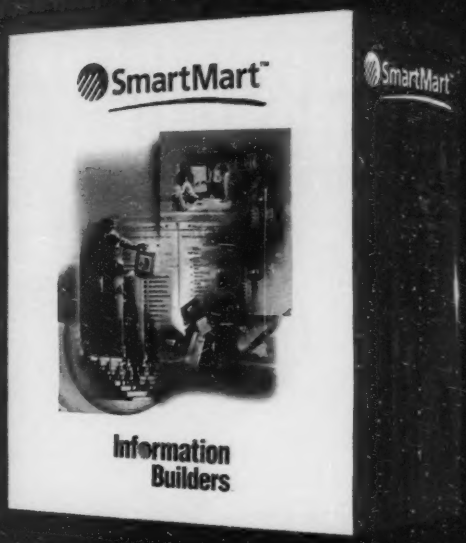

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Insurer uses workflow system to carve niche

By Barb Cole-Gomolski

BANKS, INSURANCE PROVIDERS and telephone companies all have the same problem — they sell products and services that look just like those of their competitors. For instance, customers have a hard time distinguishing one insurance company's policies from another or judging which long-distance telephone service is the best.

In businesses such as those, customers move or stay based largely on the quality of customer service they receive.

"When people call us, I want them to think, 'My God, that felt good,' " said David Ferguson, chief technical officer at ARM Financial, a Louisville, Ky., company that sells retirement annuities. That "feel good" experience translates into more sales, Ferguson said.

CALL CENTER

To spread that feeling, Ferguson is installing a system designed to let him manage in one place incoming calls and the back-office applications customer service representatives use.

The system is ViewStar 5.0 a workflow/call-center management application from Redmond, Wash.-based Mosaix, Inc. The system was designed to reduce the amount of time customer service people spend on the phone with customers, thus saving money, But Ferguson said he is less concerned about reducing talk time. He wants the conversations between his 35 customer service representatives and the agents or customers that call in to be more fruitful. Customer service representatives will be able to tell, for instance, whether an agent calling in has sold one annuity or 300, Ferguson said.

Chris Selland, an analyst at The Yankee Group in Boston, said Mosaix's approach of combining call center management and workflow is unique and can be powerful for certain companies. "It's a good fit for companies where calls are typically passed off to somebody else in the company," he said.

On the downside, the marriage of call centers and workflow could result in larger-scale applications that would need to be significantly more scalable than the average workflow application.

ViewStar 5.0 is the first major software upgrade since workflow maker ViewStar Corp. merged with call-management vendor Digital Systems International, Inc. to form Mosaix. The ViewStar system works with Mosaix call-management systems and those from other vendors. And ViewStar 5.0 now lets users with World Wide Web browsers have access to workflow applications.

Patrick Funck, project manager at Zurich American Insurance Group in Schaumburg, Ill., said Zurich has about 10 remote locations that previously couldn't participate in workflow applications. They can do so now via browsers. "Some of these offices have fewer than four people, and it just didn't make sense to put in $100,000 worth of infrastructure to support the workflow application for them," Funck said. □

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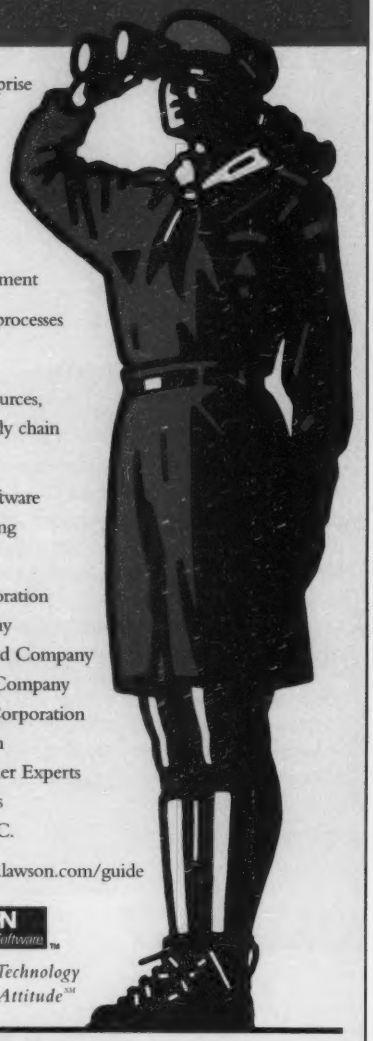

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Cisco preps Web-based management idea

CONTINUED FROM PAGE 53

ated with the design, deployment and operation of a Cisco network. That will be done by integrating point applications from more than a dozen companies they have acquired.

Cisco will use the Internet as a "platform" for a series of applications that could eventually eliminate the need for their alternatives.

"What Cisco is doing is completely 'Webifying' their network management," said an analyst briefed by Cisco. "And they're adding value by providing a tie to [Cisco's] customer service World Wide Web site for service and support." The analyst requested anonymity.

NEW RELEASES

On tap for mid-October is Cisco Enterprise Accounting for NetFlow. That package performs end-to-end network accounting, which lets users monitor and control network costs. Administrators can identify usage by device, application, end user or department and charge them accordingly.

Also due is Cisco Works for Switched Internetworks 2.1, which will let users more easily identify and troubleshoot problems in their networks. It also helps them with campus network design and planning.

The San Jose, Calif., vendor said it will develop versions of those packages for Windows platforms.

Cisco now offers Cisco Works, a series of Simple Network Management Protocol-based internetworking management software applications. They allow for monitoring of devices, easy configuration maintenance and Cisco product troubleshooting.

The applications have been integrated with several popular network management systems, including SunNet Manager on Solaris workstations, HP OpenView on Sun Microsystems, Inc. and Hewlett-Packard Co. systems and IBM NetView for AIX.

George Deyett uses Web-based functionality with Cabletron Systems, Inc.'s Spectrum network management system.

"We use a Web server to send reports to interested parties," said Deyett, telecommunications operations manager at Polaroid Corp. in Waltham, Mass. Polaroid is a Cabletron and Cisco shop.

Deyett hasn't closed the door on Cisco.

"I'd be interested in anything Webwise that Cisco could develop for its Catalyst 5000 LAN switches," he said.

Another Cisco user said Web-based management is a big step in the right direction.

"What we eventually want is Web technology combined with 'push' technology," said Joe Askins, director of data communications at Arizona State University in Tempe.

"If we have a problem with the network, we want a system that can use push technology to notify me immediately," Askins said. □

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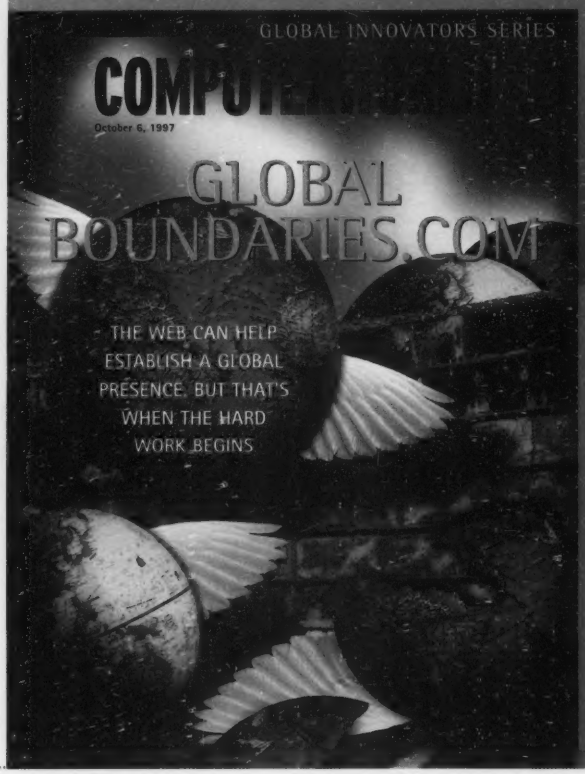
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100 Hot Emerging Companies

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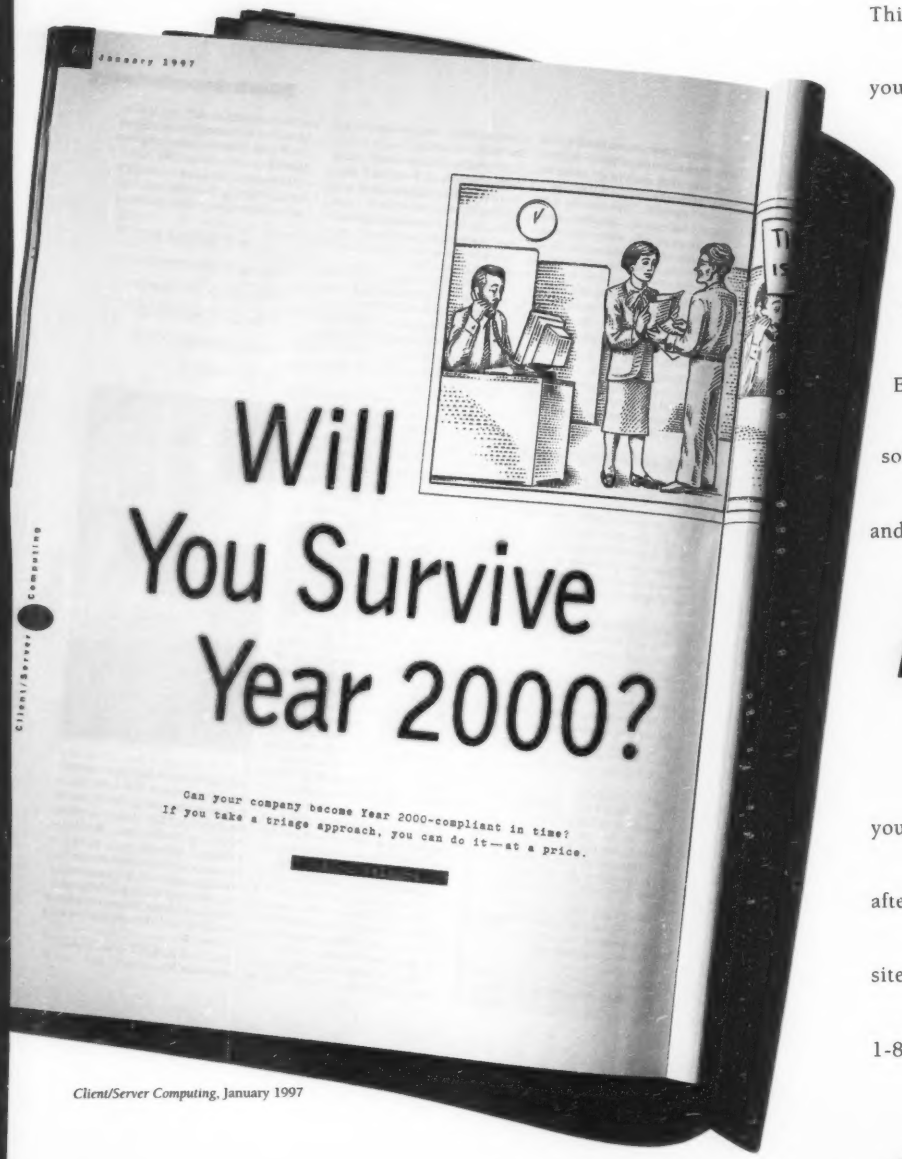
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EDITOR'S NOTE

Cutting through the hype that enshrouds many IT industry start-ups is like trying to see through the dark: the farther and deeper you go, the scarier it gets. It's an imposing task separating worthy start-ups from also-rans, since for every credible high-flying entrepreneur there's a shameless self-promoter who makes P.T. Barnum look like a fanatic Hyde Park crier.

Why is it so tough? Plentiful venture capital: It's raining green for almost anyone with a reasonable concept, track record and business plan. Everyone's trying to cash in on the Internet — and beyond! And many start-ups want you to believe they're the next Intel, Microsoft, Netscape or Cisco — or just a notch below.

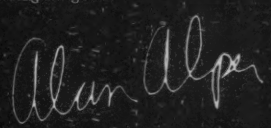
It's in the spirit of exploration and demystification that *Computerworld* unfurls this supplement before you. Our premise: Given technology's warp-speed gyrations, you can use some help evaluating the many emerging outfits seeking to be your "strategic partner."

We started our "Hot Emerging Companies" pursuit by surveying 600 IS managers and 70 consultants and venture capitalists about start-ups they felt could make a meaningful contribution to the industry. Our criteria: The companies had to have started up after Jan. 1, 1990, had to have less than $100 million in sales, and had to be for-profit ventures.

We took their recommendations and surveyed more than 350 start-ups. We collected a wide variety of data during the past six months on their capitalization and sources of financing, revenue and profit growth, product lines, major customer references and executive teams. A team of CW editors and researchers continuously cross-checked and updated the data to make sure the nominated companies met our criteria.

A panel of experts — Howard Anderson, president of the Yankee Group in Boston, Roger McNamee of Integral Capital Partners in Palo Alto, Calif., and Steve Wolt of IDG Ventures (a sister company to Computerworld) in Framingham, Mass. — then helped distill our list to 100 of the hottest emerging companies we could substantiate. They judged the nominees on their technological innovation and potential to either solve IS problems or help generate business value for their customers.

Our list is highly focused on networking start-ups, with an obvious predilection toward the Internet. What else would you expect: The network has finally become the computer! Sure, there are some fashionable names on the list, and others you probably haven't heard of. But all in all, we think this supplement can be a starting point for identifying those start-ups with a fighting chance to help your organization achieve its business and technological goals.



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On our cover: Black and white photos, in rows from left to right: Dan Brickland, Ken Olsen, Ralph Ungermann, Adam Osborne, Seymour Cray, Bob Metcalfe, Philippe Kahn, Mitch Kapor, Roger Sippl, Robert Hoffman. Color photos, clockwise from upper right: Richard Schwartz (Diffusion), Bob Davis (Lycos), Zach Reinart (NetDynamics), Dave Stamm (Clarify), Jerry Yang and David Filo (Yahoo).

By Alice LaPlante

Surprise, surprise. Technology is not the No. 1 factor in determining whether a high-tech start-up will break away from the pack

Formula for success: Equal parts pain, vision, money, luck and timing

"Man is most uniquely human," wrote the American philosopher Eric Hoffer, "when he turns obstacles into opportunities."

That pretty much sums up the key ingredient for determining if a high-tech start-up has a fighting chance. Not whether an established entrepreneur has a stunningly brilliant idea. Not whether the best and brightest whiz kids from Stanford or MIT are on the founding team. Not whether the company has deep-pocket funding available from the hottest venture capital team. And certainly not whether a cool — or even *the* coolest — technology is ready to ship.

No, the No. 1 determinant of whether a particular company is going to make it is whether people — somewhere — are in pain.

That is, whether there's a serious problem disrupting the lives of potential customers.

"People will *not* beat a path to your door just because you have a great product," warns David Cearley, vice president and service director for Workgroup Computing Strategies Service at Meta Group, Inc. in Stamford, Conn.

But if a new enterprise offers a cost-effective antidote for that pain, then, maybe, there's a chance of success.

Of course, a number of other ingredients for success emerged when we talked to the men and women actually out on the firing line. Like vision. Passion. Marketing savvy. Good old-fashioned luck. And yes, naturally, competent technology.

Read on, and see for yourself.

1. A whole lotta pain.

This is completely nonnegotiable: There must be a big — and as-yet unsolved — problem out in the world.

"The trick is to successfully identify a problem that is costing people unacceptable time and money and aggravation," says Richard Schwartz, chairman and chief technology officer of Diffusion, Inc., the Mountain View, Calif.-based maker of IntraExpress, an Internet-based "push" product. "Then, when you show them your solution, they will immediately — and urgently — demand to buy it."

2. Timing, timing, timing.

It's really quite simple. You can't be a moment too early introducing your product or service. Or a millisecond too late.

If you're too early, you end up doing

Photographic illustration by Ralph Mercer

what Shikhar Ghosh calls "missionary work." "People must already be talking about the problem, must already agree that something needs to be done," says Ghosh, CEO and president of Open Market, Inc., a maker of Internet transaction management and access-control software based in Cambridge, Mass.

"Timing sinks a lot of companies," concurs Schwartz, who held off building a Java-dependent product for this reason. "Someone might have a great idea. And there might be a genuine need for the product. But they can run out of money waiting for the market to catch up."

When Shlomo Kramer and Gil Shwed — who met while serving in the Israeli Army — came up with the concept in 1992 that eventually turned into Check Point Software Technologies Ltd., an Israel-based manufacturer of network security products, they ended up shelving the idea for a full six months. A dangerous thing to do in the fast-moving world of high-tech start-ups? Not at all. In fact, it was the *only* thing to do, according to Kramer, now executive vice president of the firm, which today commands a 44% share of the global firewall market, according to The Yankee Group.

"We knew it was an interesting idea, that we had identified a real need and had a unique approach, but we also knew that the market wasn't quite there yet," Kramer says. If a small company comes out with a product even slightly early, he says, it runs the very real risk of depleting its funds while waiting for the world to catch up. "There's also the human side," he points out. "A start-up is a very demanding environment, and although living through the 'anticipation' phase is doable for a year or two, if it takes longer than that, your team might not endure."

3. Unyielding vision, endless flexibility.

When Michael J. Lyons was building his first high-tech start-up in 1977, at the age of 26, he was told by experts at IBM and Digital Equipment Corp. that what he wanted to do — design a Cobol engine to restructure aging corporate applications —was impossible.

"Fortunately, I was too stupid and too young to listen," says Lyons, who just launched his fifth start-up: Arriba Tech, an Emeryville, Calif.-based Internet content management services firm. And that, he says, is the point. "You must have a vision that isn't swayed by anybody," he says.

Check Point Software's Kramer recalls that perhaps 80% of the people he talked to about his concept for a shrink-wrapped network security product tried to convince him it wouldn't fly. "You must believe in your vision," he says. "Listen to everyone, and take advice from everyone, but at the end of the day, it must be your decision and no one else's."

And with this type of vision comes the ability to say "no."

Bob Davis, president and CEO of Lycos, Inc., in Framingham, Mass., an online "orientation point" that provides news, views, reviews and a search engine to help people navigate the World Wide Web, points out that the heads of successful start-ups will inevitably be faced with the fact that "there's too much opportunity out there." Lycos, for example, boasted 200,000 daily visitors in 1995. Today, more than 7 million Web browsers visit its site each day. "Dozens of companies come to us, looking to leverage this traffic. We have to be very focused."

Davis believes that allowing growth to get ahead of available resources could spell disaster. "If you don't have the people and the infrastructure to deliver, you run into trouble," he says. (See story, at right.)

Other entrepreneurs agree, but they caution that unyielding vision must be coupled with the willingness to be extraordinarily flexible.

John Butler is president and CEO of Network Integrity, Inc., a Marlboro, Mass.-based maker of network recovery systems. When he was working with his three partners in 1992 to develop a business plan centered on data protection for corporate networked computing environments — which they thought held tremendous revenue potential — they rejected a number of initial ideas as "nonunique." "At first, we considered some fairly conventional concepts for backup storage," he recalls. "Most of them did not demonstrate sufficient novelty. Although we could see flaws in the current products, there was no fundamental advantage to entering the market."

Yet sticking to the notion that corporations dependent on networked computing would need to guarantee the integrity and availability of network data, Butler and his partners kept running ideas past potential customers and venture capitalists until they came up with the design for what turned into their flagship product, LANtegrity.

4. Enough money — from the right people.

Then there's the money thing. Most founders of high-tech companies recommend having enough venture funding to continue operations for six months to a year.

"Give yourself a chance," says Jim Dorian, chairman and founder of Arbor Software Corp., in Sunnyvale, Calif., maker of Essbase, online analytical processing server software. "It's very time-consuming to have to keep looking for money. You will want to put your efforts elsewhere. So make sure you have a financial lifeline."

But the source of the money is also key. Having venture partners who support the founders' vision and who will work in harmony with the management team is absolutely critical. (See related stories, pages 6 and 14.)

5. Lady Luck.

Zack Rinat, president and CEO of NetDynamics, Inc. in Menlo Park, Calif., which markets Internet-based products for delivering networked applications, met his business partner because their children attend the same private school. Arriba's Lyons bumped into his first business partner in a technical headhunter's office.

Who says luck has nothing to do with it?

"Software is the toughest Pac-Man game in the world," Lyons says. "You can have the product marketing, the product positioning, the finances — and yet the whole thing dies. No matter how smart and how prepared and how experienced you are, you won't get anywhere without a little luck."

Alice LaPlante is a freelance writer based in Woodside, Calif.

The rise and fall of Avalon Software

Photo: David Zick

Kim Sheridan

In 1992, Tucson, Ariz.-based Avalon Software, Inc. was looking good.

Founded in 1973 by engineer Kim Sheridan, the firm developed integrated business software for midsize manufacturers. By the early 1990s, it was widely perceived as a rising star in the enterprise resource planning (ERP) software market.

Ahead of its time in catching the client/server wave, Avalon saw its sales swell to more than $21 million in 1994. The company garnered rave reviews from analysts for technological innovations well in advance of industry giants such as SAP AG and The Baan Co. By January 1995, Avalon was the world's fifth-largest manufacturer of ERP software. Riding high, Avalon estimated that fiscal 1995 sales would exceed $45 million.

Then came the fall.

Although 1995 revenues yielded a respectable $33 million, the company was late shipping the latest release of its flagship product. It also made what many observers believed was a fatal decision to continue developing for the Sybase platform and failed to meet commitments to major customers. By early 1996, the firm had lost key marketing and sales executives and had begun running short of funds. Even after raising $15 million in additional venture capital, Avalon struggled to maintain viable cash flow and filed for bankruptcy on July 3, 1996. In September 1996, IFS Industrial and Financial Systems, Inc., an international ERP software supplier, purchased Avalon's assets for less than $3 million.

What went wrong? Analysts say Avalon demonstrates how it's not enough to be the first — or even the best — company to hit a market with a particular "gotta-have-it" product. "Avalon had all the makings of a success," says Jim Shepherd, director of research at Boston-based Advanced Manufacturing Research, Inc. "They certainly had the right product at the right time." The only problem was that Avalon was making the sort of commitments that even a much larger and better-funded company would have had trouble meeting.

"You have to remember, they were still just this little Tucson firm," Shepherd says. "But they got seduced by success." When global players such as SAP and Baan released comparable products, "Avalon's competitive advantage dried up."

Avalon's founder agrees. "We basically outgrew our capability to deliver," Sheridan recalls. His advice to would-be high-tech entrepreneurs: "Don't sign contracts which say you'll deliver technology or functionality that doesn't yet exist."

Despite the painful process of burying his company, Sheridan says, "Yes. Oh sure," when asked if he would ever join another start-up. "There's such tremendous opportunity out there, what with the Internet and World Wide Web," he says. "It's a very exciting time. Who wouldn't want to be a part of it?"

— Alice LaPlante

Truth or Consequences

Working with start-ups can be risky business — but there are ways to protect yourself

By Linda Wilson

Chip Perry, director of information strategies for The Pillsbury Co. in Minneapolis, has had ample opportunity to work with new vendors. Lately, he's been involved with vendors that build World Wide Web sites. And he's had more than his share of trouble.

So far, one of his "partners" has gone out of business; the other is too busy to support the application it built.

In the world of the Web, "nobody's expertise really spans more than 2½ or 3 years," Perry says. "There is no safe haven."

Sound familiar? Probably, if you've been in a position to work with new, unproved technologies, which by their very nature are often available only through new companies.

There's good reason to fret. New companies can go out of business or grow so fast they can't keep up with demands for technical support. The products they tout may be filled with glitches, may not work at all or may crash your entire system. Or, it may take the firms so long to get their products into production that you lose the competitive advantage you'd gambled on getting.

It's a high-risk game, to be sure, and users' experiences range from good to awful. Nonetheless, there are measures you can take to minimize your risk.

One strategy, of course, is to nail down favorable language in your vendor contract (see story, page 5).

Another is to create a thumbnail sketch of the company and its prospects for success. Ask if its founders have a good track record in technology or in founding other companies. Do they have big-name vendors as beta customers or development partners? What about marketing or distribution relationships with well-known vendors? And adequate financing from respected venture capital firms?

Then there are softer considerations: What does your gut tell you? Do you trust them? Do they come recommended by people you trust?

Knowing who you're dealing with helps

James Marek, vice president of retail banking at The City National Bank of Taylor (Texas), took a risk on Edify Corp. in Santa Clara, Calif., because he knew and trusted a senior sales engineer, Eric Tamblyn in Plano, Texas, from a former business relationship.

Though Edify, founded in 1990, wasn't brand new, Marek considered the company young enough to be risky, especially since he would be one of its first major customers. When City National purchased Version 4.0 of the Electronic Workforce, a tool for building interactive self-service applications, in December 1995, it became the first retail banking customer to do so.

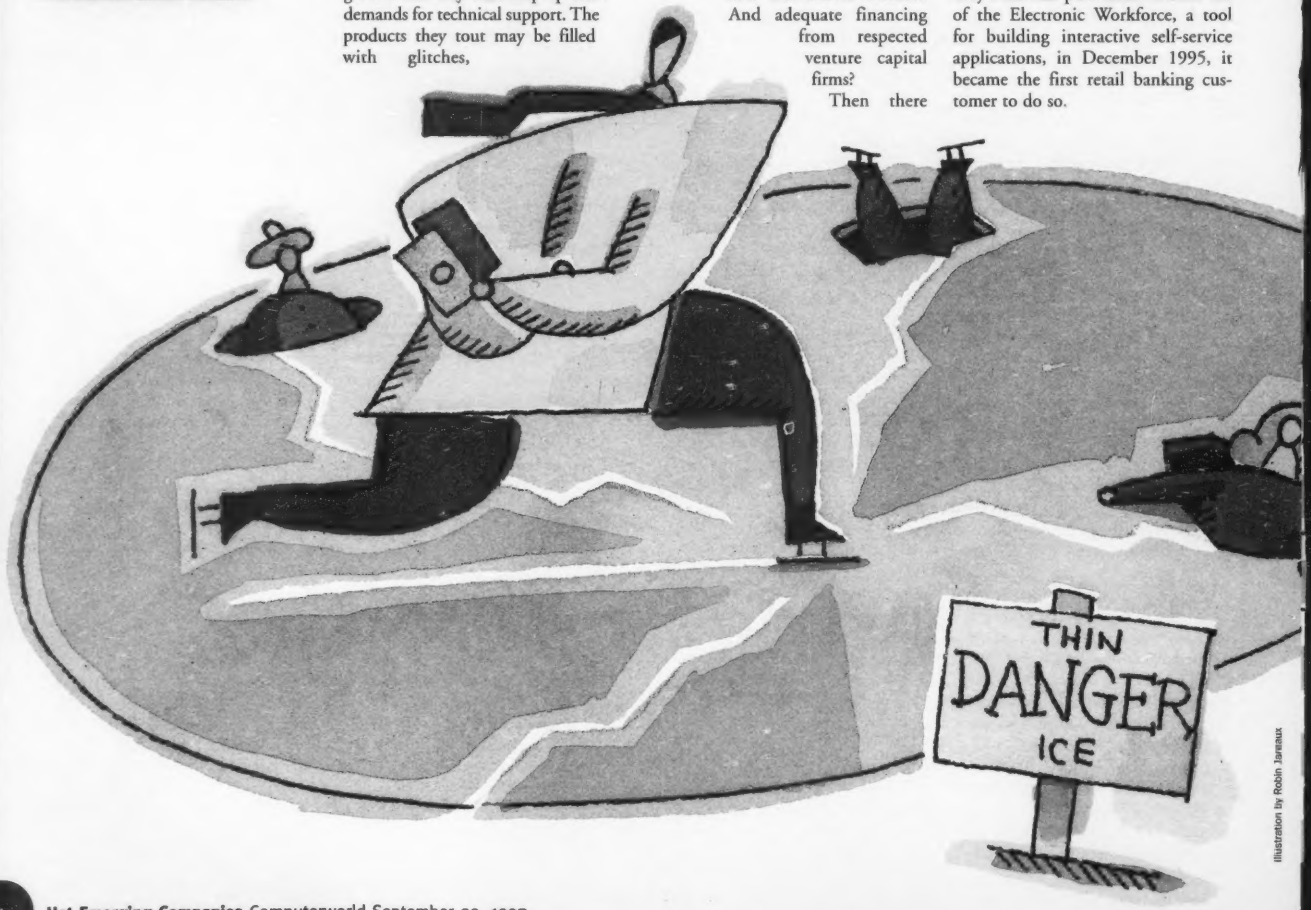

Illustration by Robin Jareaux

City National wanted the product to build two related applications. One gives customers real-time access to account information via the Web; the other gives access to account information via an interactive voice-response system.

"We had to take a risk on somebody because of the newness of the [Web] product," Marek says.

Marek and Tamblyn met in 1994. Marek was having trouble with a system no longer under warranty from Syntellect, Inc. in Atlanta, a vendor of interactive voice response systems. Tamblyn, who worked at Syntellect, helped Marek fix the system on weekends as an independent contractor, with the blessing of his employer.

When Tamblyn joined Edify, he introduced Marek to Electronic Workforce. Marek says his company has been pleased with Edify's implementation, product and ongoing customer support.

Voyager on the Web: TravelNet dives in

Like Marek, Ken Leung, vice president of engineering at TravelNet in Santa Clara, Calif., chose a new Web product from a young vendor.

Leung is using Hahtsite from Haht Software, Inc. in Raleigh, N.C., to build a Web version of TravelNet's corporate travel planning and booking system, called Voyager. The Web version now has numerous pilot customers, and Haht planned to release the software late in the summer.

In deciding whether to go with Hahtsite, Leung considered the backgrounds of the company founders and company funding sources.

"I wasn't too concerned about the company going out of business, because they shared one of the same venture partners [Menlo Ventures] we had," Leung says.

The track record of Haht's founders also comforted Leung. All had experience in technology, and two of the four founders — Richard Holcomb and Rowland Archer — also had founded Q & E Software. A vendor of database access software, Q & E was sold to Intersolv, Inc. in 1994.

But what clinched Leung's decision to buy Hahtsite was his gut feeling about the company. "The president of the company [Jim Hebert] came and did a sales presentation. That told me they really wanted our business," Leung says.

He hasn't been disappointed. In the beginning, Haht sent one of its key people to TravelNet for three days, not only to explain Hahtsite to Leung's team but also to make recommendations about how to use it to build a Web version of Voyager. Since then, Leung says, Haht has worked diligently to remove bugs from its product.

"It is really about people, and they had a willingness to work together and grow as two companies," Leung says.

Trading experience for attentiveness

Roger Crowe, president, CEO and cofounder of Edify, said companies in their infancy can't offer their customers stability or certainty. Instead, they offer the hard work and attentive customer service that Leung experienced.

When Edify was new, "we tried everything we could to service [the customers] as well as we could — and not only with our services organization but with our best software engineers," Crowe recalls.

But sometimes, the relationship between an emerging company and an early customer just doesn't work — no matter how hard everybody involved tries. That's been Pillsbury's experience, though Perry declined to elaborate on the projects or to name the vendors or systems integrators involved.

In the first case, where the vendor went out of business after six weeks on the job, Perry was able to turn the job over to another systems integrator. "We took what little code was usable and threw it over to another vendor, who got [the Web site] up and running on time," he says.

In the second case, the work was completed, but customer support is so-so. "They are growing so fast that they can't support us," Perry says.

Setting up a beneficial relationship with a new vendor isn't easy. It's also not a strategy suited to every business problem or every IT manager. As Crowe recalls, "There was a self-selection process among the customers who would even talk to vendors who were brand new. [The customers] had to have a burning need to get a business problem solved and didn't see any other way to get the need solved in a short time frame.

"They also had to be risk takers," he says.

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Protect yourself in legal terms

If you're thinking about doing business with a new company offering a new technology, it's important to protect your interests in a legal contract, says Los Angeles attorney James Kalyvas.

"Being on the bleeding edge of technology is a very high-risk game," says Kalyvas, who specializes in contracts with information-system vendors for the law firm of Foley Lardner Weissburg & Aronson. "There is no other area where the 'buyer beware' applies more than in information technology."

Kalyvas suggests that any contract you sign include language that provides:

1 An Insurance Policy

Name your company in the vendor's "errors and omissions" insurance policy, although you'll most likely have to pay for your coverage. Errors and omissions insurance is a policy that software vendors purchase to protect themselves against mistakes they make in the course of doing business.

2 Damages Coverage

Compensates you for what are known as "consequential damages," which are losses that flow from a product's failure but are not directly related to it. Examples of consequential damages include lost customer orders or downtime. "Assuming this product is going to interface with other products, I'd want to make sure that if my whole system goes down, there is someone I can look to — other than me — to pay for it."

3 Cost Limits

Caps fees for implementation costs. "If this is the first time they are going to do this, it is going to take them [the vendor] a long time, and it is going to cost them a lot."

4 Escrow

Gives you the right to source code if the vendor goes out of business or is unable to provide you with adequate customer support. Most often, source code is placed in escrow.

5 A Training Schedule

Promises enough training to turn one of your people into an expert. "You want to get one of your people tuned in to the inner workings of the system, which is unusual because it would entail the disclosure of some confidential information," says Kalyvas, adding that you also could offer to sign a confidentiality agreement.

6 A Billing Schedule

Outlines a payment schedule tied to levels of acceptance testing that are based on criteria you define. For example, Kalyvas suggests three levels: The product works, it works with other software you already own and it works in a production environment.

— Linda Wilson

Surf's up, and VCs are riding the wave

By William P. Densmore

A strong economy and rush of new technologies is creating a funding undertow

Venture capital, once considered a boutique source for companies with surefire products in a unique market, is becoming a standard financing option for most information-technology start-ups.

More than $10 billion was invested in 1,502 deals during 1996 — 60 percent of those in information-technology ventures, according to the annual report of the National Venture Capital Association (NVCA). That's up steadily from $3.4 billion invested in 823 deals in 1991 (see chart, page 7).

The reasons for the growth include a relentless, tide-like rush of new technology opportunities extended by the tsunami-like influence of the Internet. This is attracting more and more investment dollars into venture-capital funds. In turn, the rush of investment fuels more ideas and more companies.

Analysts, venture capitalists and entrepreneurs alike say the cycle of money fueling technology start-ups, producing returns and attracting more money shows no sign of abating during the 1990s, regardless of macro-economic factors. The result: Companies with the right mix of management talent, product, customers and vision say they have no problem getting money.

"A company with experienced management playing in a high-growth market that is demonstrating some major shifts and with a unique and proprietary technology and high barriers to entry — that's my definition of a quality company," says Prabhat K. Dubey, president and CEO of MMC Networks, Inc., a Sunnyvale, Calif., manufacturer of processor chips for Asynchronous Transfer Mode and Ethernet networking boxes. "And for a quality company, the atmosphere is that a lot of venture-capital groups chase them. We were bombarded."

The money reaches ventures through institutional, retirement or mutual funds, which, in turn, invest in venture-capital funds. And baby boomers are making direct investments — either as partners in a venture fund, as "angel" investors on their own or as an element in self-directed 401K or other retirement plans.

Overall, prefunding valuations of start-up-stage companies — those without a product on the market yet — by venture capital firms rose as much as 50 percent in 1996 from 1995, mostly because of Internet technology companies, the NVCA report says, reaching a median of approximately $3 million.

In one sense, it's a case of too much money chasing too few good deals, experts say. But in another, it shows investors now realize that information technology has become the engine driving economic productivity in a way that wasn't as evident in the 1980s.

"Because the last several years have been met with steady economic growth and relatively low interest rates, the amount of money in the hands of institutional investors, most specifically, mutual fund and pension fund managers, has just exploded," says Terrance C. Health, a research manager at VentureOne Corp. in San Francisco, which compiles the figures used by the NVCA

Illustration by James Yang

Riding the venture capital wave

Companies reaping benefits (all industries)

Year	Total number of deals*	Total $ invested
1996	1,502	$10 billion
1995	1,167	$ 8 billion
1994	1,036	$ 5.3 billion
1993	986	$ 4.9 billion
1992	952	$ 4.1 billion
1991	823	$ 3.4 billion
1990	NA	NA

* About 60% involved information technology companies in 1996, up from 45% in 1995 for previous years.
Source: VentureOne Corp., San Francisco

and others. "There will continue to be a lot of money for start-ups to thrive on. But also a lot of money is going to be thrown at companies that probably shouldn't be funded."

A golden decade

By any measure, the 1990s have been a golden decade for technology venture investors and entrepreneurs alike.

"In the late '80s, it was very difficult to get funding for companies because there were not that many interesting new ideas," recalls David J. Orfao, president and CEO of Allaire Corp., in Cambridge, Mass., which markets Cold Fusion, server software that makes static Web sites more dynamic. Orfao is a veteran of three start-ups in 15 years. "With the paradigm shift to the Internet, I've found it to be very open to raising money," he adds. Allaire raised $5 million in second-round support from Polaris Venture Partners, BankBoston Ventures and USWest in about 60 days.

Emerging from the U.S. stock market mini-crash of 1987 and the collapse of real estate as a favored investment, venture capital funds first picked up steam as money started to flow into pension and mutual funds. Now, experts say, it is the tidal wave of new technology opportunities that is fueling the continued investment boom more than macro-economic factors, such as interest rates or employment statistics.

"We are in a climate now where the tide has been in for a long time and the question is if and when the tide will go out," says Stephen E. Coit, who recently left Charles River Ventures in Boston after a long career in venture capital. "We had some signs the tide would go out earlier this year, but frankly, now it looks like the waves are on the rocks again."

As long as new money flows in, more capital can flow out to start-ups. But if the investment money stops, according to Coit's tidal theory, venture capitalists will start to become impatient for their massive 1990s investments to return them liquidity. Others say this could put pressure on some venture-backed firms to sell their portfolio companies out to market competitors for cash.

"It's always cyclical. Anytime someone tells you a business is no longer cyclical, you should sell everything and hide," says William A. Sahlman, a professor at Harvard Business School, in Cambridge, Mass., who teaches venture finance.

Sahlman says he hasn't seen anything yet that points to a turn in venture investing, but he does believe some venture firms' returns are declining from the early '90s. "I think the moment the stock market has a real serious correction, where Intel or Microsoft doesn't do well, or when you get real intense pressure on profit margins, it dries up. But when it dries up, it sows the seeds for the next boom."

What technologies is this rush of capital funding? The favored investments shift from year to year, experts say. At the start of the decade, it was educational software, CD-ROM ventures and those in the tail-end of the computer hardware marketplace. Then came the client/server and networking infrastructure deals of the early 1990s — Cisco Systems, Inc., Shiva Corp. and others. Just as those were playing out, along came the Internet.

The Internet has fueled a new euphoria among investors and entrepreneurs alike. First, in 1994, came the Internet software makers, such as Netscape Communications Corp. Then, in 1995, came the access providers, such as Netcom On-Line Communications Services, Inc. and content aggregators such as the search engine Yahoo. In 1996, almost anything related to the Internet got serious attention, including so-called "push" technology.

Now, analysts and investors see a glut in the "push" marketplace. They are looking toward new revenue models and "tools" that make it easier to interact with customers and build corporate Web sites that link legacy systems seamlessly to the public network. Businesses based only on a concept, with no product and no customers, are now less likely to get funding than a year or two ago. But things are still not nearly as tight as the early 1990s, when all the fundamentals had to be in place.

Staffing tight

Investors, analysts and entrepreneurs predict no dramatic turnaround in the capital markets or the economy generally through the rest of the 1990s. Information technology investing will continue to rise overall, and money will flow naturally to the latest, most promising technologies, as it has throughout the 1990s, they say.

One caution: The intense pressure for skilled technologists and seasoned CEOs is making it hard for start-ups to put together teams that stay together, especially in the hot spots of California and Massachusetts.

"The giant sucking sound is created by the extreme demand for IT-capable people, and this has made it more critical from a recruiting point of view to finance new ventures with equity rather than debt," says Art Hutchinson, a senior consultant at Northeast Consulting Resources, Inc. in Boston.

The market for finding visionary CEOs has also never been tighter, Coit adds. "To found a company, you need a very accurate vision of what the market needs. It is what customers need tomorrow, not today. ... That is very, very hard to find right now."

Hot technologies

Start-up investment trends in the '90s

1990-1992: edu-tainment, CD-ROMS
1992-1993: client/server, network infrastructure
1993-1994: network infrastructure, early Internet
1994-1995: Internet access, content, search
1995-1996: Internet content, site management
1996-1997: intranet/extranet management tools, commerce

Source: Computerworld interviews with venture capitalists

Future winners

The rest of the 1990s are predicted to emerge as a period of even greater upheaval in the communications world, experts add, just as the 1980s were tumultuous for computer makers.

"People that are doing anything that is related to security on the 'net will get attention," says George M. Middlemas, managing general partner of Apex Investment Partners LLC, a major venture firm based in Chicago. "Plays that involve electronic commerce and, to some degree, network management software [will] too. I think there is going to be some interesting stuff going on in the router/gateway world."

The theme of the late '90s has been the insatiable demand for bandwidth and for mobility, adds Christopher Spray, a general partner with Atlas Venture in Boston. He calls the '90s the "golden age of information technology" (see related story, page 8).

"We have been looking aggressively at the mobile world, where the infrastructure still really isn't in place to allow high-speed data communication to take place," Spray says. "And I think in software there is a trend well under way of componentized software, and that leads to demand for integration services. I think security is important, but I don't think there is a lot of money to be made out of security. It will be built into the product, integrated much more."

Companies assisting with supply-chain management, data warehousing, online analytic processing and data mining will be favored in the months ahead, says M.R. Ragaswami, managing director of Sand Hill Group LLC, of Tucson, Ariz., which matches high net-worth individuals — "angel investors" — with firms seeking funds (see related story, page 14).

Ragaswami, whose career has included senior positions at Oracle Corp. and Baan Co., thinks the venture-capital funds will increasingly be competing with "angel" investors for investment opportunities. The "angel" can add relationships and partnerships and hands-on experience, he says, while the venture-capital community is more focused on structural and financial issues.

As long as investors perceive information technology as creating new markets and new opportunities at a rate unprecedented since the industrial revolution, new money will flow to venture capital and fuel the cycle. Only if reality proves different from perception will the tide ebb.

William P. Densmore is a freelance writer based in Williamstown, Mass.

What's Hot?
Anything connected with networking

By John Verity

Internet technologies, electronic commerce, enterprise networking and wireless communications lead the pack

Ask anyone in real estate what factors are the most important to consider when buying property, and they'll tell you, "Location, location, location." Likewise, the investment mantra in the information technology business these days is, "Internet, Internet, Internet."

And while anything related to the Internet (from electronic commerce to intranets) promises to be a hotbed of investment for some time to come, other related networking domains (TCP/IP in particular) are also bubbling with activity. Technologies, for instance, that add speed and capacity or provide remote access to enterprise backbones are brimming with investment action.

Surely you're not surprised that IP-based networking is ground zero for start-up activity? Megabucks have already flowed into 'net-related companies during the past few years, helping to contribute all that jargon and new brand names to everyday conversations: browser, cookie, Netscape, Yahoo.

Here's a look at four of the hottest areas of start-up opportunity, some of which will likely spawn their own buzz phrases. Some of the companies mentioned are on our Hot 100 list. Others are so new, they might make it next year if they successfully navigate the start-up waters.

Internet/Intranet

Internet technology is unleashing a new wave of competitors in corporate software applications. "The Web is causing a major disruption in enterprise software," says George Zachary, a partner at Mohr, Davidow Ventures, a Menlo Park, Calif., venture capital firm. And the established players may not be able to change their focus quickly enough, he says: "A whole new set of tools is needed for the Web vs. the client/server tools currently in use. Some really interesting things have been popping up over the past three to six months."

So new are the companies he's seeing in this area, Zachary says, that he's not permitted to identify them by name — not even the few in which his company has invested. Founded by small groups of individuals who've left the big enterprise software suppliers, these companies are focusing on such areas as Web-based tools and applications for building, operating and strategically using data warehouses.

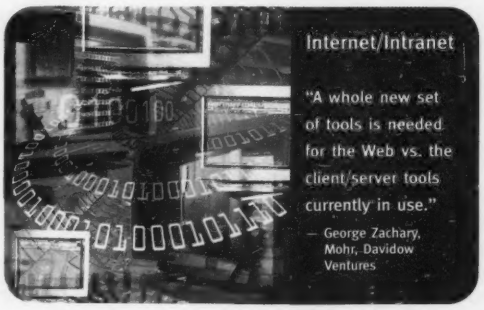
Another hot niche is tools for managing supply chains. In this category, Mohr, Davidow has funded ReQuisite Technology and Agile Software Corp., whose software helps with corporate purchasing and product data management, respectively.

Another major opportunity is arising in tools that help people collaborate over intranets — internal communications systems that would "make employees' lives easier," as Zachary puts it. Web technology is "turning groupware on its head," he says. Companies rushing into this space include Actioneer, Inc., Open Text Corp., Netmosphere, Inc. and NetXchange Communications, along with giants Netscape Communications Corp. and Microsoft Corp.

In contrast to Lotus Notes and other early groupware, many of the new breed are tailored to specific types of work.

Netmosphere's ActionPlan program, for instance, helps dispersed software development teams better coordinate their activities across an intranet. Its Java-activated web pages keep all interested parties, including suppliers, upper management and even customers, continually apprised of a project's latest schedules, engineering changes and "to-do" lists.

Actioneer, meanwhile, is designing its collaboration scheme to accommodate mobile, so-called thin-client devices — handheld computers, for example, that get most of their software in the form of Java-based applet programs off the Internet.



Internet/Intranet

"A whole new set of tools is needed for the Web vs. the client/server tools currently in use."

— George Zachary, Mohr, Davidow Ventures

Electronic Commerce

Having proved itself for electronic publishing and entertainment, the Internet is finally poised to take on true electronic commerce — especially the more complex, business-to-business variety. The value of business electronic-commerce transactions (including business-to-business and business-to-consumer) will hit $120 billion by 2000, according to some fairly optimistic analysts' assessments. But not without the production of many new products and services, says Bob Chatham, senior analyst at market researcher Forrester Research, Inc. in Cambridge, Mass.

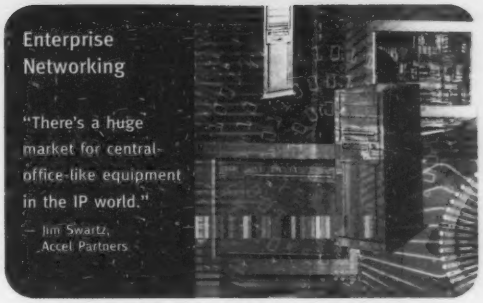
Electronic Commerce

The value of business electronic-commerce transactions will hit $120 billion by 2000, according to some optimistic analysts' assessments.

So-called extranets, which connect a company to its suppliers and customers, are relatively straightforward to wire

Illustrations by Eric Yang

up, he points out, but then what? Without specialized software to help administer a trading community of, say, 1,000 companies, the result will be chaos. What's needed is some way to keep the trading partner's client portion of the electronic-commerce software (transaction processing routines, for instance) up to date, maintain directories and control access down to the level of specific employees.


Enterprise Networking
"There's a huge market for central-office-like equipment in the IP world."
— Jim Swartz, Accel Partners

Chatham is seeing start-ups deliver prepackaged solutions for a number of industries. Helping financial firms use the 'net to research reports about fixed income investments, for instance, is a company called PFN, Inc. in Boston and New York. Its software oversees the movement of reports from a shared, central server to each client's server, making sure the latest information is always available.

InStream Corp. in Burlington, Mass., is addressing the mental health care market with a type of workflow software product that coordinates the movement of documents and other information between managed healthcare providers and professionals in their offices. "Setups like this will start popping up all over the place," Chatham says.

More generic schemes are in the works, too. Start-ups such as Supplyworks, Ariba Technologies and Actra, the joint venture between Netscape and General Electric Information Services, are scrambling to automate corporate purchasing — arguably the ripest business for Webification right now. Among other functions, their setups will let a supplier of office supplies, for instance, create for each of its customers a tailored catalog that displays only authorized products and prices and that makes sure individual employees don't spend more than their set limits. Purchases will be sent automatically to the supplier, eliminating almost all of the typical $150 cost required to process a traditional purchase order.

Also coming are all-electronic markets, such as the Web-based auction service developed by a start-up called Free Markets Online. It targets markets such as plastic injection molding or metal casting, in which hundreds, or even thousands, of companies may compete for contracts requiring very customized work. After qualifying a good number of, say, injection molders in its comprehensive company database, Free Markets will distribute the required software to them all and, finally, run an electronic auction for its client. Lasting several hours, such auctions can slash the cost of searching for a supplier and produce a 15% to 20% savings in the contract itself.

Enterprise Networking

Of course, by virtue of its booming growth and endlessly extensible protocols, the 'net will constantly demand and absorb every new communications technology that comes its way. But capacity is increasingly an issue, as companies strive to tie far-flung branch offices and factories, their customers and suppliers, telecommuters and legions of road-warrior employees back into the corporate intranet.

Ideally, these users would have enough digital bandwidth for not only simple Web access but also for voice calls and eventually full-blown video-driven multimedia applications. The telephone companies' networks, originally designed for handling voice calls, aren't up to the job, so there appears to be a major opportunity in selling them advanced digital switching gear.

"The phone companies have never understood data, and they never wanted to, but now they absolutely have to," says Ken Zita, an independent telecommunications researcher in New York. Adds Jim Swartz, managing partner at Accel Partners, a major venture capital firm based in San Francisco: "There's a huge market for central-office-like equipment in the IP [Internet Protocol] world. Items such as terabit routers are only a couple of years away." Accel itself has put money on router start-ups Avici Systems, Inc. and Hybrid Networks, Inc.

Faster desktop processors, 3-D graphics and multimedia Web pages are all fueling demand for increased Internet bandwidth. One result: A host of companies are scrambling to corner the nascent market for so-called gigabit Ethernet gear. This equipment will help move and route data packets about 10 times faster than today's products.

New York research firm Technologic Partners has identified 15 such start-ups which, together, have raised more than $75 million in funding, making this "the most competitive market" since the first Ethernet hubs and multiprotocol routers. With names such as Gadzoox Microsystems, Inc. and Yago Systems, Inc., these companies are gearing up to muscle in on the four main suppliers of IP routers: Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc. and 3Com Corp.

From $73 million in initial sales this year, according to market researcher Dataquest, the gigabit Ethernet market should grow to $2.9 billion in 2000. By then, even faster networking gear will likely be emerging from laboratories, setting off a new round of competition.

Wireless

The implicit goal of the digital revolution might be stated as "access to any information, anytime, anywhere." And so, as everyone from executives to salespeople and maintenance workers come to depend increasingly on laptop computers, personal digital assistants and other handheld gizmos, demand for reliable, robust wireless links to the Internet is exploding.

Voice-oriented cellular service hasn't really fit the bill, but the wireless industry is spawning dozens of new companies and new technologies that just may do it. What's more, wireless is poised to revolutionize standard, fixed-location telephony and cable TV delivery, as well.

"Wireless will be delivering voice, video and data, and lots of new companies will be needed to develop the required technologies," says Peter A. Rinfret, president of Rinfret & Co., a New York-based investment bank focused on the telecommunications market.

Today's wireless mobile market, consisting mainly of cell-phone service, is already $24 billion a year, and it's predicted to hit $75 billion by 2000. A major component of that will be delivering high-speed Internet access to mobile devices, and that will require new technologies and products for dealing with the inevitable transmission errors.

The big question for the start-ups that will attack those and other technical problems will be which of the many proposed wireless schemes will prevail — and when. The schemes currently run the gamut from all-digital but relatively low-bandwidth personal communications phone service — a competitor to cellular that's just now hitting the U.S. market — to Flash Gordonish setups proposed by Motorola, Hughes Spaceway, and newcomer Teledesic Corp. in which swarms of low-orbit satellites will flood any spot on the earth's surface with megabits of data per second.

Led by cellular pioneer Craig McCaw, Teledesic has some financial backing from Microsoft Chairman Bill Gates. A company called Telegent, meanwhile, has a service that transmits voice calls and as much as 380K bits of data per second to mobile users.

And then there are the fixed-location wireless schemes, another big opportunity for hardware and software makers. Companies such as Cellular Vision USA, Inc., Bosch (using technology purchased from Texas Instruments), Hewlett-Packard Co., NewBridge Networks Corp., Broadband Networks, Inc. and Siemens are all focused on so-called local multipoint distribution systems (LMDS) — a technology that could compete with traditional copper cables for delivering phone, T1-speed data and full video service to homes and businesses. One start-up building an LMDS service is Advanced Radio Telecom of Bellevue, Wash.

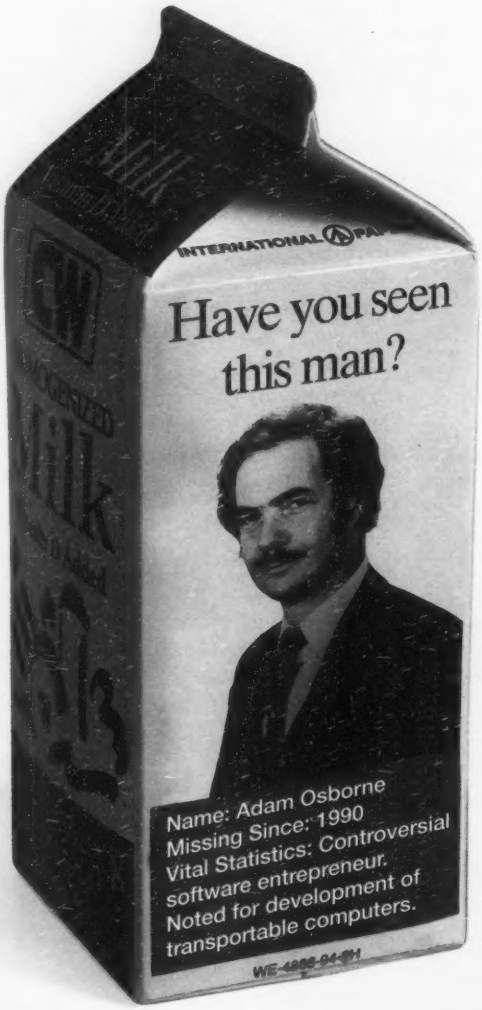
Such new technology, and so many choices, is making for a muddled and somewhat hesitant market — at least for now. "Customers don't understand wireless yet," Rinfret says. "The technology's evolving so fast."

John Verity is a freelance writer based in Brooklyn, N.Y.

Sequel Stories: Why once

By Rochelle Garner

Driven to remain "players," technology entrepreneurs want to prove that their vision is correct — even if the odds are against them


Have you seen this man?
Name: Adam Osborne
Missing Since: 1990
Vital Statistics: Controversial software entrepreneur.
Noted for development of transportable computers.

Like Rocky Balboa battling through sequel after sequel, many successful high-technology entrepreneurs constantly struggle to recapture their first championship.

It's not about the money. Clearly, such companies as Cirrus Logic, Inc., Ungermann-Bass, Informix Corp. and Digital Equipment Corp. have endowed their founders with the wealth to retire to a life of luxurious obscurity (even if that is contrary to the technology culture, where only "players" have status).

Instead, it's about winning: To prove to the world that their technology vision is correct. Their hope: To match the brilliance of their original start-up.

Odds are, they can't. Venture capitalists say only one in 20 start-ups succeeds. Still, those chances do improve when the founder has already been tested.

"Ventures that get started by someone who did it before have a 1-in-3 chance of success," says Roger Sippl of Sippl/Macdonald Ventures, which invests in early-stage start-ups. "But skill and hard work alone won't do it. You have to be lucky, too." Sippl's name might strike a more-familiar chord when paired with the company he founded: Informix of Menlo Park, Calif.

Clearly, Sippl has experience on both sides of the start-up fence. Since branching into his new field seven years ago, he has made some notable investments, including Vantive Corp., Red Pepper Software (acquired by PeopleSoft, Inc. for $220 million) and Illustra Corp. (bought by Informix for $400 million).

His return on investment has made him extremely, um, comfortable.

Photographic illustration by Dan Beard

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
Intranet Products ❑ Yes ❑ No

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is not enough

And yet, despite knowing the odds against him, he has stepped back into the management marathon required to run his own start-up: Visigenic Software, Inc., of San Mateo, Calif., which develops software tools to build, deploy and manage the new breed of object applications. This is the ultimate thin-client system, with only the graphical user interface on the user's desktop, and every other process needed by a company scattered across servers dedicated to different applications.

Does he really think Visigenic can eventually match Informix in size and revenue? Without question, although he admits: "It's pretty rare to match that same sort of success." But that's not the only reason he's again decided to head his own company. "I guess you could say I'm in technology jail because I'm good at it," he says. "If I were single, I'd work 10- or 12-hour days because it's fun, and it's fun because you're succeeding. Plus, it's also the sense that you've done something important — that you have a conviction that, despite the naysayers, you proved was right."

Battle Cry

That's definitely driving Ralph Ungermann to spend 15-hour days at his latest venture, First Virtual Corp. in Santa Clara, Calif.

Twice before, Ungermann has tasted the heady wine of industry prescience. Remember Zilog, Inc.? Founded in 1974, Zilog actually had more early PC wins, with its Z80, than did Intel Corp. But when the fun went out of Zilog in 1978, Ungermann turned his attention to a different, unproved technology: local-area networks. So he and friend Charlie Bass sold their Zilog shares to form Ungermann-Bass, at a time when neither venture capitalists nor customers saw a need for such new-fangled computer connections. And yet, despite the world's initial indifference, UB had become a market leader by 1988.

Today, Ungermann aims to achieve the same pioneering success with video networking, which combines videoconferencing with interactive video presentations. "This time, I'm not going to lose that lead," says Ungermann, with absolute conviction. "I'm driven to create something, and the only way to measure success is financial — to be the one company that grows fastest and gets biggest.

"Right now, my guiding star is to take this company public this year, and create billions of dollars of shareholder value," Ungermann says. "That's the scorekeeper in this valley. How else do you know you've won if you don't know what the score is? And winning is important." Then, he adds: "I like the battle. I like the fight."

Fight. Fun. Conviction. These same ingredients help explain the newest object of Ken Olsen's passion: Advanced Modular Solutions, Inc. of Boxboro, Mass. Forced out of Digital Equipment Corp. in 1992, Olsen almost immediately funded and later joined his latest venture, designed to offer fault-tolerant, rack-mounted server and storage systems for Windows NT. Such systems function as computers locked away in a back room, far away from a company's campus in case of disaster. Think of Olsen's products as updated versions of Digital's original minicomputer.

Not exactly common wisdom, is it? "I've always been the iconoclast, always doing things the world is ridiculing," Olsen says. "Most of my years, I've been considered the dumbest man on earth by the Boston Globe. That I didn't understand the mainframe was dead and how could I be so stupid. But I say it isn't dead, and fault-tolerant computers aren't dead. People want reliable computing, especially in industries like telecommunications and finance."

And so, at 71, Olsen finds himself putting in the kinds of hours that many people his age prefer to spend on the golf course. Why does he do it? "You do what seems important, and what's important is the most satisfying," Olsen says. "I keep telling myself I'm not doing this to prove something, but to explore something new and to show how something can be done."

Plus, says Olsen, it's fun. Fun to tempt a bit of risk and danger. Fun to learn something new. And perhaps most of all for Olsen, fun to teach young people the art and skill of running a company. Because, oddly enough, Olsen doesn't rattle on about market presence or solving customers' problems when asked what he hopes to accomplish with his new company.

He talks about building an organization. "In this modern world, people are losing the basics and the passion of running a company by plan, by discipline and by budget," Olsen says. "When budgeting and planning got lost at Digital, Digital deteriorated. I say you should dream about profit-and-loss statements when you drive. You should love it. And I do."

"I keep telling myself I'm not doing this to prove something, but to explore something new and to show how something can be done."

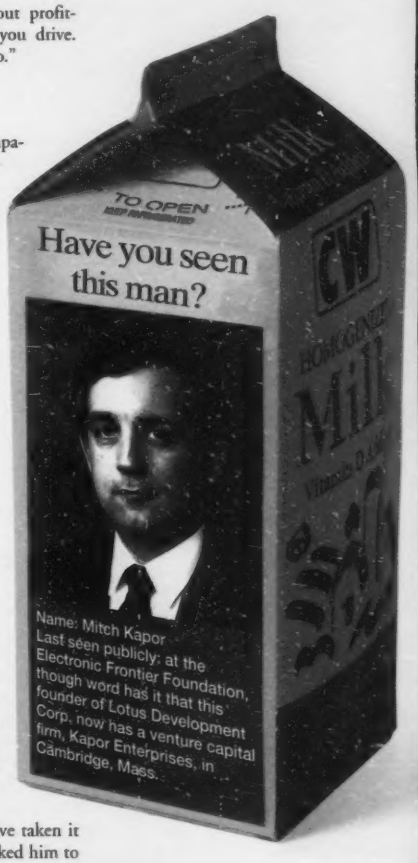
— Ken Olsen

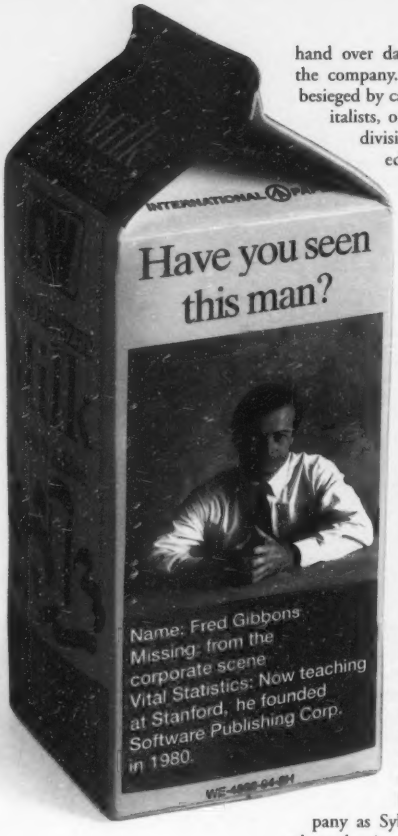
The Player

Let's face it. Building a company takes a decidedly different set of skills than running a large, established organization. That's one reason so many successful entrepreneurs eventually are forced out of the very companies they founded. But once in their blood, the adrenaline rush of start-up fever can't be dimmed.

That — and the fact they crave their old role as "player" — compels them to try again. "You get caught up in the industry, of building a company, of creating not only interesting technology but creating jobs as well," says Mark Hoffman, co-founder and former president and CEO of Sybase, Inc. and president, CEO and chairman of CommerceOne, in Walnut Creek, Calif., which provides interactive systems for electronic commerce between businesses.

Sure, Hoffman could have taken it easy after Sybase's board asked him to


TO OPEN
Have you seen this man?
CW
Name: Mitch Kapor
Last seen publicly: at the Electronic Frontier Foundation, though word has it that this founder of Lotus Development Corp. now has a venture capital firm, Kapor Enterprises, in Cambridge, Mass.


Have you seen this man?
Name: Fred Gibbons
Missing: from the corporate scene
Vital Statistics: Now teaching at Stanford, he founded Software Publishing Corp. in 1980.

hand over day-to-day operations of the company. And, in fact, he was besieged by calls to join venture capitalists, or run other companies' divisions. He wasn't interested. But then he saw CommerceOne, a small start-up that was going nowhere. Hoffman felt he could take the company down paths it only dreamed of. Here was a company trying to compete in a world Hoffman understood: transaction processing, mission-critical and widely deployed applications. And so, when invited to run the company, Hoffman jumped at the chance to once again put in 12-hour days.

"I want to be known for growing great companies and for developing a technology that contributed significantly to the industry," says Hoffman. "CommerceOne has the potential to become as big a company as Sybase did. I want it to play a dominant role."

Redemption

Sometimes, though, a dominant role doesn't do much good — especially in a market going nowhere. Just ask Kamran Elahian, whose Momenta Corp. created a media frenzy around the fizzled market of pen computing. Five years ago, Momenta crashed — burning up $40 million in funding, racking up another $18.4 million in liabilities and costing 150 people their jobs. Those figures placed Momenta among the biggest start-up failures in the industry. And it sent Elahian into an indigo funk. For seven months, he traveled from Fiji to Turkmenistan, like a pilgrim seeking forgiveness.

"I realized that just starting a company for money and fame isn't that interesting."

— Kamran Elahian

He got it. As it turns out, venture capitalists *like* someone who's been seasoned by fire. It removes the patina of arrogance that settles over a success-too-easy. And before Momenta, Elahian had founded two easy successes: CAE Systems, Inc., which he sold to Tektronix, Inc. for $75 million, and Cirrus Logic, Inc. So, not long after returning from his world travels, Elahian was approached by Kleiner Perkins Caufield & Byers to once again try his hand at forming a company. The result was NeoMagic Corp., which develops graphics- and video-processors for mobile computers. In three rounds of financing, NeoMagic attracted $20 million from such venture capital heavyweights as Kleiner Perkins, Sequoia Capital, US Venture Partners and Integral Capital Partners.

"I could never get such high-powered people to invest in Cirrus Logic, but they said they valued me more for having been through one failure," says Elahian. "Now, I constantly try to remind myself to stay humble. That's why I still have my Momenta license plate." This past March, NeoMagic reaped $36 million in its IPO — allowing Elahian to install that plate on his new Ferrari F355.

Elahian has three other new ventures in the works: PlanetWeb, which develops Internet browser software for the consumer marketplace, Centillium Technology, which is developing chips to reduce the Internet's bandwidth problems, and Projectneat — a nonprofit organization that so far has donated 27-inch televisions and Internet appliances (such as the Sega Saturn) to 5,000 of the world's poorest schools.

"After Momenta, I did a lot of spiritual searching, and I realized that just starting a company for money and fame isn't that interesting,," Elahian says. "I was hit by the notion of bringing the world closer together, of somehow doing something that benefits human beings."

But don't mistake Elahian's newfound spirituality for pure altruism. He's still in the ring, battling for the gold buckle that only champions wear. It's just that he tries to let others share in his championship.

Rochelle Garner is a freelance writer based in San Carlos, Calif.

Have You Seen This Entrepreneur?

We know they're out there: Once high-flying entrepreneurs who haven't been heard from since being counted out by the industry. You know, people like Fred Wang, Finis (pronounced Fy-nis) Conner, Fred Gibbons and Adam Osborne.

Remember Conner? His Conner Peripherals, Inc. was the fastest growing company in the U.S. But after he sold the company last year, he dropped from sight. But don't put his face on a milk carton just yet. He recently told a reporter that this fall, he'll become "the garbage man of the disk drive industry." And while he wouldn't get into specifics, he did say his company, with the working title of Stor-Recovery, will oversee the reuse of older disk drives.

Then there's Fred Wang, credited with running Wang Laboratories, Inc. (founded by Fred's father, An Wang) into the ground. And while he's still on Wang's board of directors, Wang recently founded his own company: Archive Technologies Corp. in Boston. So what exactly does the company make? It wouldn't say. "We're still a young start-up," says an Archive spokeswoman. "Stay tuned."

Fred Gibbons still hasn't decided whether he'll start another company. Founder and former chairman of Software Publishing Corp., in Mountain View, Calif., Gibbons now teaches business management for engineers at Stanford University's Graduate School of Electrical Engineering. But that role has made him a mentor for wannabe entrepreneurs — as in the young graduate students who went on to found Yahoo. "I walk them through what's needed to get to the stage where they're fundable," Gibbons says. "I'm not an investor in these things; I get paid in stock."

But, says Gibbons, he finds this harder work than actually building a company. "It's hard because you don't have the applause of the crowd, and because it requires more discipline because you can't make people do stuff. You can advise but not force. You have zero control."

And Adam Osborne? Good question. No amount of digging has revealed the whereabouts of the man whose company, Osborne Computer, started the mobile computing market. Maybe if we put his face on a milk carton ...

— Rochelle Garner

What's Hot, What's Not

By Howard Anderson

Howard Anderson is the founder, president and managing director of The Yankee Group and one of the founders of Battery Ventures, both of Boston. Anderson was an adviser to Computerworld's "Hot Emerging Companies" project. He can be reached at (617) 956-5000 or at handerson@yankeegroup.com

What makes a hot company?

The obvious answer: The right product in the right market with the right distribution and the right strategic partners at the right time. The company doesn't necessarily have to be making money, but it does have to be growing at more than 25%.

Who decides if a company is hot?

The market decides — not the venture capitalists, not the PR flacks, not esteemed trade publications like *Computerworld*. The market decides by its buying power and its search for leadership and technical advantage.

How about reference accounts?

About 300 vendor companies each year visit The Yankee Group, and every single one tells us that Bear Stearns or DuPont or General Electric loves their product. We've gotten cynical about these claims. It's not whether these references have tried, or even bought, the product. Somewhere, sometime they buy one of everything!

The real criteria are: Has the reference account standardized on the product — is this the product that is going to be used throughout the company? Are they putting the product into a production environment?

What single thing makes a company hot?

If it is in the right market sector. It's never the case that there is a hot company in a cold market. If sales force automation is "hot," then companies such as Aurum Software or Siebel Systems may be hot. There also may be "cold" companies in that sector, but there are never hot companies in a cold sector.

Do venture capital companies bet on hot sectors?

No, venture capital companies bet on the next hot sector. That's tough to do. Who knows when these sectors will get hot? Battery Ventures, where I am a general partner, bet on neural networks in 1984. The market got hot in 1994! On the other hand, our investment in Fore Systems paid off 50-to-1 within 24 months.

Does venture capital backing mean that a company is more likely to be "hot"?

Curiously enough — yes! It's damn tough to get a first-tier venture company to invest, even though each year there is $6 billion or $7 billion in new venture funding. There is a rigor and a discipline that venture capital companies look for.

There is a very real difference between hot companies and hot products. We don't expect hot companies to be fully formed yet — they are too new and they are still essentially one-trick ponies. The best of these have products that are leading their market and products that come in families. They scale. There is a connection between the products and the customers. They are getting overseas sales and sales with some volume. Sometimes, though, a product may be worthwhile, but the volume isn't enough to build a company around.

Shouldn't a hot company be ahead of the curve?

Sure, that's axiomatic. But a smart company might have read the tea leaves right — perhaps anticipating that the largest end users, The Yankee Group 200, as we call them, were going whole hog to NT or Windows. That company's innovation, its niche, might have been a product that fit right under that umbrella. But if Microsoft decided to incorporate that feature or that function in its next release, they're toast.

Does that happen often?

About a dozen times a week.

Anything else make a company "hot"?

Yes, when the company builds an alliance with its end-user customers. Look how Aurum built an alliance with MCI for sales force automation, or how Owens Corning built one with SAP for worldwide finance. Those are the kinds of alliances that will scale and then port to other companies.

> Hot products come first. Then more hot products. Then you are a hot company.

Can you be a hot company and not have hot products?

No. Hot products come first. Then more hot products. Then you are a hot company. And if you can do it long enough, you become a great company. Examples: Compaq. Oracle. Microsoft. The entire industry was built on hot products; the best companies were able to build a system of hot products. Every one of our end-user clients says the same thing to us: "We want fewer vendors, but we want more from them!"

For a company to break into that space means that they have to either dislodge the incumbent or convince the user that his homegrown solution is both too expensive and underpowered. No company starts life as a "strategic" vendor; it's earned.

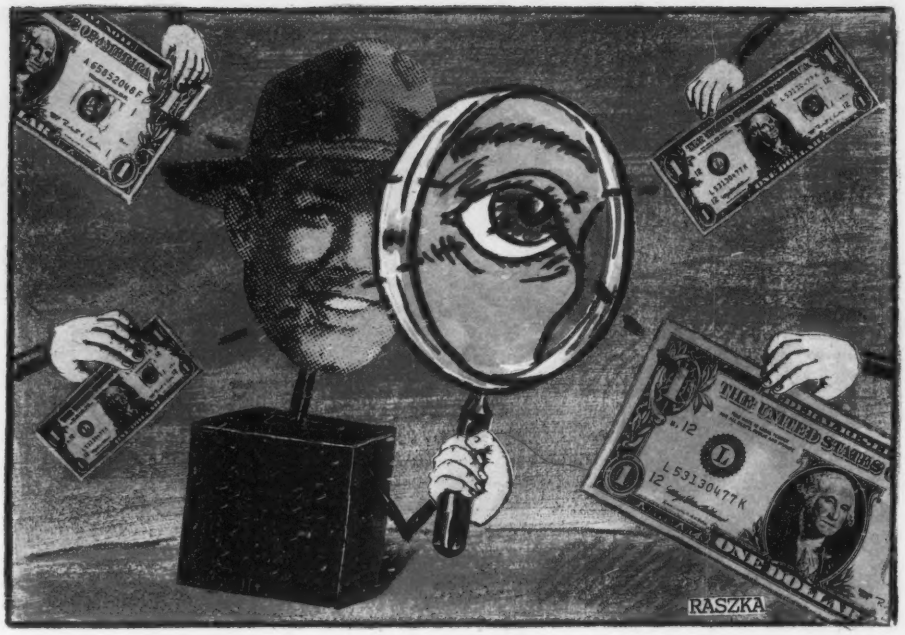
Final thoughts:

Every user should take part of the IT budget and take some degree of risk with hot companies and products. Not a lot, maybe 4% of the total budget. It is with these "hot" products that true breakthroughs occur. But those users have to be sure of a few things, all of which come under the heading of due diligence. A sampling:

- What are the other products promised? When are they going to come? How many engineers does the company have dedicated to that project?
- How good is the management of the company? Are they the founders or hired guns? What has their track record been? You will always be told that the "venture capitalists" are solidly behind the company. Are they? Talk to people who really know.
- How good is the marketing? Remember, a company may have great technology and stable financing, but if it can't market, it will miss its numbers and it will starve support.
- Don't just talk to the early users — go visit them! In their shop — and without your vendor "handler" going along.

By Rochelle Garner

Young firms need money and influence — and investors of all walks are lining up to provide them with both



Looking for cash? You may not need to go far

You're in luck.

Investors of just about every sort — from angels to venture capitalists, with big business in between — are lining up to give young businesses new money.

We're not exaggerating. In Boston and New York, local newspapers constantly carry advertisements from self-proclaimed "angels" looking for promising start-ups. In Silicon Valley, where funding has become high art, an "old boy" network of technology high rollers constantly scopes out the Next Big Thing to put money on. And around the world, big business seeks out a stake in new technologies that could bolster their current markets or give them an edge in new ones.

Yes, they all write checks. But each kind of investor has its own agenda in bankrolling a start-up. That agenda can undermine your marketing efforts, contradict your business plan — or propel your company into a lucrative IPO. It's for this reason that start-up veterans advise new entrepreneurs to offset risk by combining traditional venture capital with angels, institutional partners and corporate investors. And if you want to move up the money chain, timing matters.

"It's rare to get corporate financing without first having received venture financing," explains David Liddle, CEO of Interval Research Corp., a "start-up incubator" in Palo Alto, Calif., that provides literally everything a new company could need to become successful.

Adds Les Vadasz, Intel Corp.'s senior vice president of corporate business development: "Sometimes, we'll walk away from investing when a venture capitalist isn't involved. That [absence] can say that the company's management isn't flexible enough to listen to outside voices who can help grow the company."

So why would start-ups steer clear of venture capitalists? Because of the way VCs do business. Investing $1 million and more for a majority stake in a company, venture capitalists can — and sometimes do — remove a founding entrepreneur from the helm of a struggling company.

But, some experienced entrepreneurs say, that shouldn't matter.

"I say, don't worry about losing control. You will either be in control or you won't — it has nothing to do with the percentages the VCs have in your company," says Adi Gamon, president and CEO of Carnelian, Inc., a start-up that sprang from Interval Research to provide publishing systems on the Internet. "It's a mistake to go after a lower class of investors just because you think you'll have more control. I say the better the investor, the better your chance of succeeding. Their connections, their wisdom, their ability to help you, especially when you don't want to be helped, will all make your stock worth more."

Illustrations by Brian Rasuka

Clearly, whom you approach for cash is as strategic a decision as any you'll make.

Investor Portfolio

Hugh Mackworth, president and CEO of Digimarc Corp., definitely exercised care in the feeding of his company.

Based in Portland, Ore., Digimarc has developed digital "watermark" technology that embeds copyright information inside graphic art and photography. Click on an electronic rendering of a picture and — voila — see who created it. That capability could have huge ramifications for professional artists, if it can find a way to pervade the entire graphic arts industry.

Some of Digimarc's most recent investors give it a huge leg up. These include Just Systems Corp., a Japanese software developer and distributor that plans to include Digimarc's technology in its own products, and Adobe Ventures, the venture funding organization founded by Adobe Systems, Inc. That endorsement has led to Adobe incorporating Digimarc technology in every copy of its Photoshop product. Presto: Instant credibility, automatic distribution, valuable business and customer contacts, and entree into Adobe's labyrinthine organization for potential additional alliances. Other investors include AVI Capital in Los Altos, Calif., and Softbank Holdings, the venture capital arm of Japanese conglomerate Softbank Corp.

"By getting both sides, we have the independence and perspective that a venture firm can provide, as well as a close relationship with corporate partners," says Mackworth. "The kind of strategic relationships we have with Adobe is critical to our success in this country. But at the same time, if Adobe were our only investor, then Micrografx, Corel and Live Picture would be less enthusiastic in working with us. You have to be careful not to alienate anyone by the investors you keep."

In other words, Mackworth has successfully balanced his investor portfolio. That's key, say those who've played the funding game. And the reason has to do with why corporations invest: They want to fuel their own growth. Sometimes, that means funding companies whose products rely on these larger corporations' technology — and, thus, grow the market. Sometimes, it means endorsing new technology that these companies can themselves use.

"Corporate investing will become an even greater trend, especially among companies that feel they need to be involved in early technologies that will impact their business in a strategic way," says Carnelian's Gamon. "Sure, strategic investors often come in at a higher valuation per share than a VC will, because corporations are looking at what you can do for their business. But relying on strategic investors can be dangerous, since their goals can change and their interest in your company can go away. That's why you want to make sure to have investors who are in it purely for the financial gain."

VeriSign, Inc. of Mountain View, Calif., has that sort of investor in Bessemer Venture Partners and Kleiner Perkins Caufield & Byers. These top-tier VC firms added their muscle in VeriSign's second round of financing. But it's VeriSign's third round, totaling $30 million, that earned *Red Herring* magazine's award for Best Strategic Financing Round of 1996. For VeriSign, which is in the digital certificates business, its investors are its customers. And they include Microsoft Corp., Cisco Systems, Inc., Reuters Ltd., Merrill Lynch, Softbank, First Data Corp. and Intuit, Inc.

"We realized we had to be careful not to pick investors who could alienate potential customers," acknowledges Stratton Sclavos, president and CEO of VeriSign. "That's why the most important thing we did before embarking on this round was create a list of companies from various industries we thought would make sense strategically."

No, Sclavos isn't using "strategy" as just another platitude. He and his chief financial officer, Dana Evans, deliberately went after investors that could come to the table with more than money. "When drawing up that kind of list, it's important to think about the strategies you are trying to execute on," Evans says. "In our case, it was distribution channels and driving market adoption. We went after companies we thought could help with those aims."

Creative Funding

Katrina Garnett believes the same should be true of individual investors. "You can have active or passive investors. I chose active investors because there's so much value in their participation," says Garnett, founder and CEO of CrossRoads Software, Inc. in Burlingame, Calif. A former Sybase, Inc. executive, Garnett and her husband, Terry, formerly of Oracle Corp., also put in $3.5 million during the course of three rounds of financing.

Garnett's list of "active" investors sounds like a "Who's Who" of high rollers: Michael Dell (the guy with the computer company down in Texas); Dave Duffield, chief executive officer of PeopleSoft, Inc.; Andy Ludwick, former CEO of Bay Networks, Inc.; Roger Sippl, founder and former CEO of Informix Corp.; and Frank Quattrone, CEO of Deutsche Morgan Grenfell Technology Group.

Clearly, these people have a fair amount of disposable income — and a healthy knowledge of the computer industry. For Garnett, the combination is ideal.

"If someone writes a personal check for $1 million, he wants to know about every decision I make, and he wants to do all he can to help me become successful," Garnett says. "They all review the business plan, they all have a great personal network to tap into. With one VC firm, you get the benefits of that one firm. I have 50 different investors that all bring their connections to me."

Although almost all of Garnett's investors are individuals, she did persuade a few high-profile corporate and institutional investors to back her venture, too. (More than she was looking for, in fact. The company was seeking $8 million in its recent round of funding and raised $12 million, instead.) Founded to integrate enterprise applications from different vendors, with general availability slated for year's end, CrossRoads has received funding from such heavyweights as Intel, Venrock Associates, SAP AG and Ernst & Young.

In practically every case, each offers more to CrossRoads than money. Take SAP, for example. It provides insight into the complex workings of its R/3 enterprise system. And Ernst & Young? It's actually sending people to Burlingame to help CrossRoads with its development projects and is its initial professional services partner.

Time will tell if Garnett's selectivity in raising capital benefits her investors by means of a lucrative IPO sometime down the road. Nonetheless, she deserves credit for having learned the lessons taught by other start-ups. "Your investors are a critical success factor," says Carnelian's Gamon. "A check is a check. It's what they do besides that counts."

Rochelle Garner is a freelance writer based in San Carlos, Calif.

Hatching an idea

There's a relatively unknown source of funding, one that's potentially rich in value but fairly difficult to tap into, called the start-up incubator.

The best known are Interval Research Corp. in Palo Alto, Calif., and Idealab, Inc. in Pasadena, Calif. Both have different charters but claim to handle just about everything possible for a toddling start-up struggling to run: legal counsel, administrative help, designers, programmers, access to some of the finest business minds in the industry and enough money to last a while.

The difficulty? Getting Interval Research to notice an outsider's idea is next to impossible. (The incubator tends to commercialize internally generated ideas.) Idealab, while advertising for business ideas, has so far given birth only to ideas that sprang from the head of its founder, Bill Gross.

One such business is Ideamarket, based in Austin, Texas. Its aim is to sell intellectual property (a la analysts' reports and articles) on a pay-per-view basis. Gross conceived the idea, brought in computer press columnist Jim Seymour as a partner, then recruited Peter Lewis of the New York Times as vice president/editorial director.

"Idealab is a shared pool of legal professionals, administrators, designers and programmers that we can tap into at any time," Lewis says. "Plus, Bill [Gross] gave us $1 million in seed money, as well as providing contacts to top-tier venture capitalists."

Periodically, all of the CEOs from the Idealab family get together to kick around ideas and advice. "It's a deluxe way to start a company," Lewis says.

— Rochelle Garner

100 Hot Emerging Companies

Name	City	State	Product Description/Category	President/CEO	Employees
3Dfx Interactive, Inc. www.3dfx.com	San Jose	CA	3-D graphics accelerator chip set for high-performance simulation	L. Gregory Ballard	103
Acacia Networks, Inc. www.acacianet.com	Lowell	MA	Programmable, stackable switch, supports 10M bit/sec.,100G bit Ethernet speeds and Web management	Michael P. Gagnon	70
Actioneer, Inc. www.actioneer.com	San Francisco	CA	Groupware to capture and share action information with anyone on the Internet, linking them on-the-fly to people, projects, documents, time and place	Brian Smiga	25
Active Software, Inc. www.activesw.com	Santa Clara	CA	Java-based software that allows organizations to integrate the information resources across the enterprise	Stephen MacDonald	40
Actuate Software Corp. www.actuate.com	San Mato	CA	Provides distributed reporting from databases	Nico Nierenberg	75
Allaire Corp. www.allaire.com	Cambridge	MA	Rapid application development system for building interactive Web sites	David J. Orfao	72
Alternate Solutions, Inc. www.altsol.com	Camp Hill	PA	Design, installation and support services for LAN and WAN networks	Jeff Colosimo	50
Arbor Software Corp. www.arborsoft.com	Sunnyvale	CA	OLAP server optimized for management reporting, planning, analysis and data warehousing applications	John Dillon	250
Art Technology Group www.atg.com	Boston	MA	Personalized marketing and selling software	Jeet Singh	115
Brightware, Inc. www.brightware.com	Navato	CA	Automated inbound telemarketing agent that reads and fulfills customers electronic requests	Chuck Williams	125
BroadVision, Inc. www.broadvision.com	Los Altos	CA	Software for development and operation of Internet, intranet and extranet business applications	Pehong Chen	200
Calico Technology, Inc. www.calicotech.com	San Jose	CA	Electronic commerce buying and selling system	Alan Naumann	85
Check Point Software Technologies Ltd. www.checkpoint.com	Redwood City	CA	Enterprisewide security framework for Windows NT and 95	Gil Shwed	150
Clarify, Inc. www.clarify.com	San Jose	CA	Client/server customer service and support applications	Dave Stamm	400
Concentric Network Corp. www.concentric.net	Cupertino	CA	Dial-up Internet access/Web hosting and service provider	Henry R. Nothhaft	350
Cruise Technologies, Inc. www.cruisetech.com	Arlington Heights	IL	Wireless handheld device that remotely accesses a server	Chris Gladwin	33
Cybercash, Inc. www.cybercash.com	Reston	VA	Digital currency	Bill Melton	225
CyberGuard Corp. www.cyberguardcorp.com	Fort Lauderdale	FL	Network security software	Robert L. Carberry	120
CyberSafe Corp. www.cybersafe.com	Issaquah	WA	Client/server authentication software	Daniel Webb	176
DataMind Corp. www.datamindcorp.com	San Mateo	CA	Server-based data mining tools	Eric Archambeau	43
Dazel Corp. www.dazel.com	Austin	TX	Output management software	William Bock	100
DeltaPoint, Inc. www.deltapoint.com	Monterey	CA	Web site creation and management tools; Web site animation and multimedia creation software	Jeffrey F. Ait	50
Diamond Lane Communications Corp. www.dlcc.com	Petaluma	CA	High-speed Internet and XDSL access technology	George Hawley	62
Diffusion, Inc. www.diffusion.com	Mountain View	CA	Push technology and management tools for groupware, E-mail and fax	Jim Gagnard	40
Diva Communications, Inc. www.diva.com	Oakland	CA	Manufacturer of digital, wireless gear	Amine Haoui	50
Eagle River Interactive, Inc. www.eriver.com	Chicago	IL	Interactive CD-ROMs for the Internet	Terry Graunke	600
Edify Corp. www.edify.com	Santa Clara	CA	Agent technology for self-service applications	Jeffrey Crowe	300
Evolutionary Technology Internat'l, Inc. www.evtech.com	Austin	TX	Tool that automates extraction, transformation and migration of data in diverse computing environment	Katherine Hammer	175
Excite, Inc. www.excite.com	Redwood City	CA	Internet search engine	George Bell	200
First Virtual Corp. www.fvc.com	Santa Clara	CA	Products that deploy business-quality video over ATM and Ethernet	Ralph Ungermann	55
Forte Software, Inc. www.forte.com	Oakland	CA	Application development environment to build, deploy and manage distributed computing applications	Martin J. Sprinzen	400
Foundry Networks, Inc. www.foundrynet.com	Sunnyvale	CA	Gigabit Ethernet switches	Bobby Johnson	50

Source: Computerworld and company reports; information as of Sept. 1, 1997

Key Funding Sources*	Year Founded	Public/Private
VenRock; U.S. Venture Partners; Chemical Venture Partners; NorWest Venture Partners; $33M raised in June 1997 IPO	1994	Public
Alpine Technology Ventures; Ray Stata; $7M	1995	Private
Privately funded	1994	Private
Enterprise Partners; KPCB; Sierra Ventures; Lehman Brothers; Bayview; $12M	1995	Private
Accel Partners: $1M; Mohr, Davidow: $3.5M; Sequoia Capital: $4M	1993	Private
BankBoston Ventures, Inc.; Polaris Venture Partners; $9.3M. other venture partners: $2.3M	1995	Private
Internally funded	1990	Private
Hummer Winblad; Sequoia Capital; Accel Partners; $25M raised in 1995 IPO	1991	Public
Softbank Ventures, Inc.: $3M	1991	Private
Norwest Venture Capital; Venrock Associates: $3M; J.P. Morgan	1995	Private
Sutter Hill Ventures; The Mayfield Fund; Itochu; Ameritech; $10.2M. June 1996 IPO: $21M	1993	Public
KPCB; Integral Capital; Mayfield Capital; $4M	1994	Private
June 1996 IPO: $30M	1993	Public
December 1995 IPO: $24M	1990	Public
Racal-Datacom; Softbank Holdings; Telecom Italia; $55M. Montgomery Sec.: $25M; GS Capital; KPCB; $10M	1991	Private
Battery Venture Partners; Bessemer Ventures; $12M.	1997	Private
Intel; Cisco; Verifoam; $10M. February 1996 IPO: $40M	1994	Public
NA	1994	Public
Accel Venture Partners; Polaris Venture Partners; $6M	1991	Private
Atlas Venture; Draper Fisher; Sequoia Capital; Sofinnova; $13M	1994	Private
Sevin-Rosen; Austin Ventures; SSM Venture Partners; Sigma Partners; $16.7M	1991	Private
December 1995 IPO: $6.6M	1995	Public
Sevin-Rosen; KPCB; Crosspoint Venture Partners; Oak Investment Partners; $17.5M	1995	Private
IVP; Matrix Partners; Brentwood Venture Capital; $11M	1995	Private
Crosspoint Ventures; Brentwood Venture Capital; Burr, Egan Deleage Venture Capital; $38M	1993	Private
March 1996 IPO: $45M	1994	Public
Sutter Hill Venture Capital; Highland Capital Investors; $24.2M. March 1996 IPO: $39.2M	1990	Public
Bob Inman; Menlo Ventures; Arete Ventures; New Enterprise Assoc.; Cornerstone Equity Investors; Bank of Boston; $15M	1991	Private
April 1996 IPO: $34M; Intuit: $40M	1994	Public
Private sources; Accel Venture Partners; AT&T Ventures	1993	Private
March 1996 IPO: $35M	1991	Public
Crosspoint Venture Partners; IVP; Dixon Doll; $5.75M	1996	Private

* Dollar amounts are totals for all sources listed, unless they directly follow a source.
KPCB = Kleiner Perkins Caufield & Byers Java Fund. IVP = Institutional Venture Partners.

Amos Wilnai

MMC Networks aims to be Intel of networking

Tiny MMC Networks, Inc. — whose not-so-modest goal is to be the Intel Corp. of networking — is prospering as much for what it hasn't done as for what it has done in the technical boxing ring.

The Sunnyvale, Calif., silicon designer, which makes innovative Asynchronous Transfer Mode, Ethernet and fast Ethernet switching chip sets, has become an ally of such market leaders as Cisco Systems, Inc., rather than a thorn in their sides.

"We have done joint development, and it has been a very synergistic relationship," says Anthony Alles, director of ATM and gigabit Ethernet product marketing for Cisco, which first incorporated MMC Networks' chip ser in its ATM switch systems in late 1995. "They have world-class ASIC design capabilities, and over time, they have developed networking expertise of their own."

The $10 million company, which turned the corner — and its first profit — during the first quarter of 1996, attributes its mounting success to its fundamental ViX switching architecture that is etched into the company's chip sets. The architecture, which significantly improves on the so-called crossbar data switching method, is a shared memory architecture and wide internal bus that provides enormous bandwidth for makers of switching systems.

Implementing MMC Networks' chip sets enable OEMs to provide switching systems that can support robust, bandwidth-intensive applications such as videoconferencing between companies at low cost.

Additionally, in May, the company introduced a technology that revolutionizes the design of Ethernet and ATM switches and routers to support hundreds of thousands of data queues — for both frames and cells — by allowing priority routing for individual users and faster IP multicast delivery. This means certain traffic can be routed by priority at cost. Analysts and financial backers are bullish about the technology.

"The engineering team is very talented and has developed a unique, systems-oriented architecture in silicon," says Geoff Yang, a general partner with Institutional Venture Partners (IVP), one of three initial investors that invested $3 million in the company in July 1994.

The $10 million company attributes its success to its fundamental ViX switching architecture etched into its chip sets.

Financially, the company is in solid shape. Yang says IVP helped steer MMC Networks away from disaster, urging company founders to become an OEM supplier and a partner to switch-system manufacturers, rather than a competitor. The company has been profitable for six consecutive quarters and has barely dipped into the total $10 million in venture capital funds raised since its founding in September 1992, he adds.

With the revolution in corporate networking under way, MMC Networks seems well positioned to ride the wave of the Internet. Nevertheless, the silicon developer has to guard against competition in the shadows and the risk of growing too quickly, observers say, pointing out the drought of talented engineers.

Amos Wilnai, founder and chairman of MMC Networks, declined to say how profitable the company is, except to note that profits represent a "significant percent" of the $10 million in revenues during 1996.

By Paula Rooney, a freelance writer in Boston.

Name	City	State	Product Description/Category	President/CEO	Employees
GeoTel Communications Corp. www.geotel.com	Littleton	MA	Intelligent call router	John Thibault	100
GlobalCom, Inc. (No Web site)	Wyckoff	NJ	Network services for sales and support environments	Matthew Ryffel	NA
Icat Corp. www.icat.com	Seattle	WA	Electronic commerce catalog software developer	Craig Danuloff	120
Ichat, Inc www.ichat.com	Austin	TX	Interactive, Internet-based communications software	Mark Saul	72
Imedia Corp. www.imedia.com	San Francisco	CA	Video compression technology	Efi Arazi	20
IMR, Inc. www.imrgold.com	Englewood	CO	Archival and retrieval software for CD-ROMs	Robert Drucker	42
Informatica Corp. www.informatica.com	Menlo Park	CA	Client/server tools for building, deploying and managing data marts	Diaz Nesamoney	89
Information Advantage, Inc. www.infoadvan.com	Eden Prairie	MN	OLAP and ROLAP software	Larry Ford	227
Infoscape, Inc. www.infoscape.com	San Francisco	CA	Tools for creating and deploying Java-based intranet applications	Paul King	16
Infoseek Corp. www.infoseek.com	Sunnyvale	CA	Infoseek Internet search engine	Harry M. Motro	160
Infospinner, Inc. www.infospinner.com	Richardson	TX	Software for linking Web pages to corporate applications and data repositories	Yoshi Noguchi	17
Inktomi Corp. www.inktomi.com	San Mateo	CA	Parallel computing architecture for Internet search engines using coupled cluster technology	David Peterschmidt	45
Insource Technology Corp. www.insource.com	Houston	TX	Corporate risk assessment, Web development and service provider	David Black	57
International Network Services www.ins.com	Sunnyvale	CA	Network integrator providing planning, design and implementation services	Donald McKinney	800
Intrusion Detection, Inc. www.intrusion.com	New York	NY	Windows NT security assessment and reporting tool	Robert Kane	27
KIVA Software Corp. www.kivasoft.com	Mountain View	CA	Server for deploying and managing Web-based business applications	Keng Lim	40
Lycos, Inc. www.lycos.com	Framingham	MA	Internet search engine	Robert J. Davis	125
Marimba, Inc. www.marimba.com	Palo Alto	CA	Push technology to distribute and maintain software and content within an organization or across the Internet	Kim Polese	50
MMC Networks, Inc. www.mmcnet.com	Sunnyvale	CA	Packet switching technology for ATM and Ethernet networks	Prabhat K. Dubey	50
Narrative Communications Corp. www.narrative.com	Waltham	MA	Provides feature-length interactive multimedia over the Internet	Scott Kliger	30
NetCentric Corp. www.netcentric.com	Cambridge	MA	Allows ISP to rapidly deploy and manage advanced network and telephony services	Sean O'Sullivan	50
NetDynamics, Inc. www.netdynamics.com	Menlo Park	CA	Java-based Web application development environment	Zack Rinat	85
NetIQ Corp. www.netiq.com	Santa Clara	CA	Centralized application management suite for distributed Windows NT and BackOffice applications	Ching-Fa Hwang	55
Network Appliance, Inc. www.netapp.com	Santa Clara	CA	Dedicated network file server for optimizing I/O	Daniel Warmenhoven	300
Network Integrity, Inc. www.netint.com	Marlboro	MA	Backup and recovery software for NetWare environments	John Butler	40
OnDisplay, Inc. www.ondisplay.com	San Ramon	CA	Software that enables Web data to be integrated with business applications	Mark Pine	80
Open Horizon, Inc. www.openhorizon.com	San Francisco	CA	Client/server middleware that integrates custom and off-the-shelf applications with databases	Bruce Coleman	45
Open Market, Inc. www.openmarket.com	Cambridge	MA	Software to build transaction oriented business-to-consumer and business-to-business Internet commerce environments	Gary Eichhorn	550
Optimal Networks Corp. www.optimal.com	Palo Alto	CA	Windows-based distributed application performance analyzer for IP networks	Maurice Bailey	NA
Packet Engines, Inc. www.packetengines.com	Spokane	WA	Gigabit Ethernet full-duplex repeater	Bernard Daines	100
Passport Corp. www.passportcorp.com	Paramus	NJ	Java-based client/server 4GL for building Internet and intranet applications	Richard Ramsdell	50
Persimmon IT, Inc. www.persimmon.com	Durham	NC	Software and services for distributed sales and service applications	Ian Jones	90
Persistence Software, Inc. www.persistence.com	San Mateo	CA	Software to define, generate and map snap-in objects	Christopher Keene	50
Placeware, Inc. www.placeware.com	Mountain View	CA	Interactive, multimedia Web environment for building and viewing live presentations	Bill Shott/Richard Bruce	20

Key Funding Sources *	Year Founded	Public/Private
Venture capital funding; November 1996 IPO: $24.5M	1993	Public
Privately funded	1995	Private
NA	1993	Private
Onset Ventures; Zilt Brothers Investments; $6.5M latest round	1995	Private
Privately funded	1994	Private
International Capital Partners: $1M	1992	Private
Bay Partners; Discovery Ventures; Partech International; Integral Capital Partners	1993	Private
Norwest Ventures; Sutter Hill; Menlo Partners; St. Paul Ventures; $13M	1990	Private
RedLeaf Venture Management Partners	1995	Private
June 1996 IPO: $41.4M	1994	Public
Privately funded	1995	Private
Oak Investment Partners: $8M	1996	Private
Privately funded	1992	Private
September 1996 IPO: $41M	1991	Public
Privately funded	1991	Private
Weiss, Peck & Greer: $2M; Greylock: $2M; Discovery Ventures; $500,000; Sippl Macdonald Ventures: $300,000	1995	Private
March 1996 IPO: $87M	1995	Public
KPCB: $4M	1996	Private
IVP; U.S. Venture Partners; KPCB; JAFCO; $10M	1992	Private
Greylock Management; Accel Partners; $8M	1993	Private
North Bridge Venture Partners and Matrix Venture Partners: $2.1M; private sources	1995	Private
Hummer Winblad; U.S. Venture Partners	1995	Private
Privately funded	1995	Private
November 1995 IPO: $36.4M	1993	Public
Atlas Venture; KPCB; Matrix Partners; New Enterprise Associates; JAFCO; $10.8M	1993	Private
Matrix Partners, Atlas Venture, Norwest: $10M	1996	Private
U.S. Venture Partners; PeopleSoft, Inc.; Mitsui & Co.; $11M	1993	Private
May 1996 IPO: $76M	1994	Public
Madge Networks; Greylock Management; U.S. Venture Partners; Cabletron Systems, Inc.	1993	Private
Mayfield Fund; Battery Ventures: $7.5M; 21st Century Communications Partners: $15.9M	1994	Private
Charles River Ventures and others: $3M (latest round)	1990	Private
Self-funded	1993	Private
Morgan Stanley: $4M; Thompson Clive; private sources	1991	Private
InterWest Partners; Bay Partners; Xerox; $5M (first round)	1996	Private

* Dollar amounts are totals for all sources listed, unless they directly follow a source.
KPCB = Kleiner Perkins Caufield & Byers Java Fund. IVP = Institutional Venture Partners.

INS 'network wizards' meet service need

Don McKinney

It was 1991, and Don McKinney saw that companies were beginning to connect their PCs. His idea: Provide companies with the expertise to build and manage such systems.

Today, his company, International Network Services (INS) in Sunnyvale, Calif., has revenue approaching $100 million and a secure foothold in a market otherwise dominated by behemoths such as Andersen Consulting and Pacific Bell.

The fact that INS identified the demand for network experts years ago and has focused exclusively on network services accounts for much of the company's success, says Alice Murphy, senior analyst at research firm Dataquest in Westboro, Mass. McKinney's background — with start-up work at Silicon Graphics, Inc. and Electronics for Imaging, Inc. and a stint at venture capital firm Sequoia Capital Partners — helped, too.

INS employees, known as "network wizards," typically spend six months or more solving their customers' most complicated networking problems. INS also offers EnterprisePro, a network management tool. Among the company's clients: BankBoston, a $64 billion bank whose network recently tripled to more than 20,000 desktops after a merger.

INS' revenue leaped from $150,000 in 1992 to $44.1 million last year; this year, company officials expect revenue to be $99.5 million. An initial public offering last year generated about $42 million.

And McKinney is already eyeing more challenges, including growing the electronic services part of the business.

By Louise Fickel, a freelance writer in Yellow Springs, Ohio.

Edifying the future of automated phone systems

When Jeffrey Crowe and a group of high-tech industry veterans founded Edify Corp. in 1990, "we consciously selected what we thought was going to be a large market: Large organizations that are constantly looking for ways to communicate valuable information to their customers and employees" more cheaply and more efficiently.

Jeffrey Crowe

Enter, the Santa Clara, Calif., company and its so-called "self-service" agent software. It lets companies, for instance, put lengthy voice-mail messages with menu options on their phone lines and also provides them with a secure gateway into customer information on a customer's database.

From an initial investment of less than $9 million in venture capital, Edify has been growing at an exponential rate. Fourth-quarter 1996 revenue stood at $11.2 million — up more than 100% from the previous year.

Edify products, such as ESY for PeopleSoft HRMS and Electronic Workforce, have struck a chord with corporate America; customers include Ford, Frito-Lay, L.L. Bean and Brandeis University.

For the future, Crowe says, the challenge is going to be how to "move as quickly as a $50 million company as we could when we were a $5 million one." Edify sees its growth in various market segments, as businesses both big and small turn to automated information delivery.

By William Spain, a freelance writer in Chicago.

Name	City	State	Product Description/Category	President/CEO	Employees
PointCast, Inc. www.pointcast.com	Cupertino	CA	Internet/intranet push technology for disseminating news	Chris Hassett	260
Polycom, Inc. www.polycom.com	San Jose	CA	Full duplex group conference phone	Brian Hinman	167
Premisys Communications, Inc. www.premisys.com	Fremont	CA	Technology that integrates voice, data, ISDN, frame relay and ATM into single small enclosure	Raymond C. Lin	240
Prism Solutions, Inc. www.prismsolutions.com	Sunnyvale	CA	Software to design, build and populate data warehouses	Warren Weiss	225
Progressive Networks, Inc. www.realaudio.com	Seattle	WA	Streaming audio technology for the Web	Bruce Jacobsen	265
Quadritek Systems, Inc. www.quadritek.com	Malvern	PA	Software managing IP addresses and network services for TCP/IP networks	Joe D'Andrea	70
Radnet, Inc. www.radnet.com	Cambridge	MA	Development environment for collaborative Web applications	Don Bulens	62
Rambus, Inc. www.rambus.com	Mountain View	CA	High-speed interface technology to speed data transfer to 600M byte/sec. over narrow byte-wide data bus	Geoff Tate	135
Raptor Systems, Inc. www.raptor.com	Waltham	MA	Firewall for NT applications	Shaun McConnon	126
Remedy Corp. www.remedy.com	Mountain View	CA	Client/server application suite for help desks	Larry Garlick	546
Sagent Technology, Inc. www.sagenttech.com	Palo Alto	CA	Software to connect data marts to the Internet	Ken Gardner	70
Scopus Technology, Inc. www.scopus.com	Emeryville	CA	Client/server application suite for customer service, sales and support	Ori Sasson	330
Siebel Systems, Inc. www.siebel.com	San Mateo	CA	Client/server sales force automation software	Tom Siebel	250
Soverign Hill Software, Inc. www.sovereign-hill.com	Dedham	MA	Information retrieval system for distributed data sources	Dave Champagne	40
Stardock Systems, Inc. www.stardock.com	Livonia	MI	Object software for extending 32-bit applications and utilities that run under OS/2 and Windows	Brad Wardell	NA
Starlight Networks, Inc. www.starlight.com	Mountain View	CA	Multimedia networking software to store and deliver streaming data types, such as digital motion video and audio	James Long	85
SynQuest, Inc. www.synquest.com	Norcross	GA	Real-time application for planning and manufacturing	Joseph Trino	150
Tally Systems Corp. www.tallysys.com	Hanover	NH	PC hardware/software asset management tools	Ted Jastrzemski	130
The Allegro Group, Inc. www.allegro-group.com	Dayton	OH	Gateway to connect LAN-based mail systems the Internet	Aaron Fessler	20
Torrent Systems, Inc. www.torrent.com	Cambridge	MA	Application development environment for building scalable symmetric and multiprocessing systems	Allen Razdow	25
US Web Corp. www.usweb.com	Santa Clara	CA	Internet/intranet professional services	Joseph Firmage	200
Vantive Corp. www.vantive.com	Santa Clara	CA	Client/server application suite for customer service, sales and support	John Luongo	258
Vastera, Inc. (Formerly Export Software) www.vastera.com	Chantilly	VA	Software for import/export management	Arjun Rishi	85
VDOnet Corp. www.vdo.net	Palo Alto	CA	Server that allows delivery of real-time motion video clips over the Internet	Marty Feiaro	90
VeriSign, Inc. www.verisign.com	Mountain View	CA	Digital ID's for identifying parties in an electronic transaction	Stratton Sclavos	130
Visigenic Software, Inc. www.visigenic.com	San Mateo	CA	Object request broker, database middleware software development	Roger Sippl	175
Wayfarer Communications, Inc. www.wayfarer.com	Mountain View	CA	Internet/intranet push technology for businesses	John Laing	37
WebFlow Corp. www.webflow.com	Santa Clara	CA	Web-based project collaboration software	Stephen Tulchin	40
Webline Communications, Inc. www.webline.com	Burlington	MA	Java-based call center software to blend telephone and Web customer interaction	Dan Keshian	26
Whistle Communications Corp. www.whistle.com	Foster City	CA	9-inch high box that provides access to Internet and internal E-mail	John Hamm	75
Worldtalk Corp. www.worldtalk.com	Santa Clara	CA	Directory-based software to deploy and extend corporate intranets with E-mail, groupware and security service	Bernard Harguidegui	102
XCD, Inc. www.xcd.com	Tustin	CA	Connects up to four printers to 100BaseT Ethernet networks	Jim Okubo	25
Xylan Corp. www.xylan.com	Calabasas	CA	High-speed local area and ATM switch	Steve Kim	535
Yahoo Corp. www.yahoo.com	Santa Clara	CA	Web search engine	Tim Koogle	225

Key Funding Sources *	Year Founded	Public/Private
Adobe Systems, Inc.; Compaq Computer Corp.; CUC International; Knight-Ridder; Softbank; others; 36M (second round)	1992	Private
Oak Investment Partners; Accel Partners; IVP; April 1996 IPO: $20.9M	1990	Public
April 1995 IPO: $32M	1990	Public
March 1996 IPO: $36M	1991	Public
Transcosmos/Encompass; Technology Crossover Ventures; Merrill Lynch; Velocity Capital; CSK Corp.; $17.9M (third round)	1994	Private
Norwest Venture Capital: $3.5M. Also self-funded.	1993	Private
Warburg, Pincus Ventures; private funding and others; $40M	1995	Private
May 1997 IPO: $33M	1990	Private
February 1996 IPO: $45M	1992	Public
March 1995 IPO: $41M	1990	Public
El Dorado Ventures; Crosspoint Venture Partners; Greylock; U.S. Venture Partners; $6.5M (latest round)	1995	Private
November 1995 IPO: $20M	1991	Public
June 1996 IPO: $33.1M	1993	Public
Blue Rock Capital, L.P.; Delaware and Zesiger Capital Group; University of Massachusetts at Amherst; $3.5M	1996	Private
Private funding	1993	Private
Star Venture Partners; Interwest Partners; Sequoia Capital; Accel Partners: $10M	1992	Private
John Landry; Warburg, Pincus	1994	Private
Self-funded	1990	Private
Self-funded	1995	Private
North Bridge Venture Partners; Oak Investment Partners; $3.2M	1993	Private
Softbank Ventures; Crosspoint Venture Partners; The Cutler Group; Strategic Partners; $34.3M	1996	Private
August 1995 IPO: $24M	1990	Public
Battery Ventures: $3M	1992	Private
Microsoft Corp.; US West Media Group; Nynex; Battery Ventures	1995	Private
Ameritech; AT&T; Bessemer Venture Partners; Cisco; Comcast; Intuit; KPCB; Merrill Lynch; Microsoft; Visa International; others	1995	Private
August 1996 IPO: $15.8M	1993	Public
Sequoia Capital; Hummer Winblad; Robertson & Stephens Venture Partner Co.; Bay Partners; Stanford University	1994	Private
Bessemer Venture Partners; Canaan Partners; Draper-Fisher Associates; Vertex Management; others; $15M	1995	Private
Information Technology Ventures; Advent International; Draper Fisher Jurvetson; Advanced Technology Ventures; $8.4M	1996	Private
IVP; Mayfield Fund; $7M (latest round)	1995	Private
April 1996 IPO: $14M	1992	Public
Privately funded	1992	Private
March 1996 IPO: $109M	1993	Public
April 1996 IPO: $33.8M	1995	Public

* Dollar amounts are totals for all sources listed, unless they directly follow a source.
KPCB = Kleiner Perkins Caufield & Byers Java Fund. IVP = Institutional Venture Partners.

David Hitz

Muscle matters to Network Appliance

To one Silicon Valley start-up, brawn — not brains — is the key to success. Five-year-old Network Appliance, Inc., whose revenue doubled in the past year to almost $100 million, is not trying to razzle-dazzle the marketplace through technical innovation but by filling an urgent, if humdrum, market need: fast access to network data.

The Santa Clara, Calif., company is selling a series of multiprotocol servers — dubbed NetApp Filers — that attach directly to a network and provide the muscle for quickly accessing files from the ever-growing repository of corporate data. In contrast to general-purpose servers from Sun Microsystems, Inc. and Microsoft Corp., the company's single-purpose servers offer simplicity and top performance, not complexity or compute-intensive functions, according to Phil Rueppel, a research analyst with Alex. Brown & Sons, Inc.

"Like a toaster in the kitchen, this appliance does one thing, and one thing only," says 34-year-old David Hitz, a cofounder of the company and its chief technical officer, noting that it can take days or weeks to configure a full-function Unix or NT server. "It gives fast, reliable access to files on the network. That's it."

Thus far, analysts and venture capital firms are pleased with the marketing, management and financial growth of the company, which went public in November 1995 and now employs 300 people.

Though the product offering is simple, sophisticated marketing savvy, controlled European expansion and a smart management team led by CEO Dan Warmenhoven — a former IBM and Hewlett-Packard Co. senior executive — have propelled revenue from $15 million in 1995 to $94 million in the 1997 fiscal year that ended April 30, observers say. The company's profits are 10% to 15%. "They've performed well beyond our expectations," says Don Valentine, a general partner at Sequoia Capital, of Menlo Park., Calif., one of four venture capital firms

"Like a toaster in the kitchen, this appliance does one thing, and one thing only."

— David Hitz, cofounder, Network Appliance

that invested in the company. "They've been able to grow as rapidly as possible while maintaining a strong balance sheet and a positive cash flow. They're a relatively small company in a gigantic market, but they have optimized for a narrow range of customers."

The company's support for multiple protocols — Windows NT and HTTP — in addition to its flagship Unix support is a defining strategy that put Network Appliance on the map, observers say. To its credit, Network Appliance engendered the technical help of Microsoft to engineer the CFIS protocol into its NetApp Filer.

Analyst Rueppel notes, however, that the company needs a direct sales force and more partnerships to fuel growth and withstand competition from companies such as Auepex, Inc. and Invincible Technologies Corp.

Network Appliance is poised for continued growth, and its acquisition of Internet MiddleWare Corp. and its Web proxy caching software — as well as plans to increase its investment in the Internet — is a good sign, observers say. Investors hinted that the company will likely incorporate more Internet protocols as they emerge. "There are some interesting things coming down the pike in this area," Sequoia's Valentine says.

By Paula Rooney, a freelance writer in Boston.

CIO
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true measure of its
After all, without the
collect precious data
a computer would
than an expensive
Not too long ago, companies
stored their data the way they stored
their hard goods—in out-of-the-way
warehouses where the real estate
was the cheapest. But enterprises of
all types are becoming increasingly
aware that accessible, centrally lo-
cated data warehouses are crucial
cogs in the business machine. "Stor-
age is becoming much more strate-
gic as a component in the IT envi-

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Software

Databases • Development • Operating Systems

Briefs

DATABASE PREDICTIONS

- By 2001, IBM, Microsoft and Oracle will be the major database players.
- Despite a new Windows NT focus, Informix will have less than 10% of the NT database market in 2000.
- Sybase's Unix database revenue will drop by a compound annual rate of more than 20% through 2000.

Source: Gartner Group, Inc., Stamford, Conn.

Insecure antivirus

A small Monroe, Mich., company has filed a patent-infringement suit against the two leading antivirus makers, Symantec Corp. and McAfee Associates, Inc. Hilgraeve, Inc. accused the two firms of using its process that searches for virus signatures in data being transmitted between systems. Hilgraeve said IBM has licensed its HyperGuard technology but that McAfee and Symantec didn't. Separately, Symantec announced last week that a federal judge ordered McAfee to preserve evidence in a copyright-infringement case involving allegations of stolen and copied software code.

New databases

At IT Forum '97 in New York earlier this month, IBM and Sybase, Inc. announced database upgrades as expected. They also talked some futures. IBM said it plans next month to start beta-testing a new version of its Intelligent Miner data mining software with its DB2 Universal Database. The next release of the database, due for testing late next year, will have more complete object support and the ability to manage data stored elsewhere. Sybase in Emeryville, Calif., said it expects to fold features from its Sybase MPP parallel database into the next release of its mainstay Adaptive Server Enterprise software in the second half of next year.

E-mail breeds virus epidemic

By Sharon Machlis

A YEAR AGO, there were about 40 macro viruses. This year, there are more than 1,300.

"We have seen a big shift into the macro viruses," said Michael Goddard, assistant vice president of information security at PNC Bank NA in Pittsburgh.

CLOSER LOOK
Antivirus update

The explosion in malicious code, primarily targeting Microsoft Corp. Word documents, has pushed systems administrators and antivirus vendors to focus on infected documents and electronic-mail attachments.

Until recently, viruses were typically passed around on infected floppy disks — a much slower means of propagation than E-mail, where one push of a button can easily infect an entire department.

Antivirus vendors are trying to combat the newer threat by targeting not only the desktop, but also other entry points where destructive macros can slip in: file servers, E-mail servers and the Internet gateway.

And as virus strains proliferate, the latest antivirus efforts involve analyzing a macro's behavior for potential mischief, not simply checking all macros against a

E-mail, page 60

DIANE JENSTER

Central data source boosts sales force

By Kim Girard

PACIFIC GAS & ELECTRIC CO. (PG&E) in San Francisco recently improved the productivity of its sales force by moving employees away from scattered electronic mail and telephone calls to a shared sales database that connects the company from all ends.

Using Santa Clara, Calif.-based Aurum Software, Inc.'s recently upgraded sales force automation system, 175 salespeople in 16 PG&E offices nationwide now have access to an intranet that stores a client's history, current services and potential business areas. PG&E uses an Oracle Corp. database on a Sun Microsystems, Inc. Solaris platform, and its sales force retrieves data remotely on Compaq Computer Corp. Armada laptops.

Central, page 60

Oracle system expands view for multinationals

By Randy Weston

"ACT LOCALLY, think globally" seems to be the catchphrase among application vendors these days, and Oracle Corp. is no exception.

The Redwood Shores, Calif., vendor is preparing to roll out a new version of its business-process automation software that will further allow multinational companies to get centralized views of their businesses (see chart).

SOME FUNCTIONS IN ORACLE APPLICATONS VERSION 11

Multiple reporting currencies	Allows financial analysts to draft reports in a single currency based on multiple currency data
Cross currency transactions	Handles transactions involving multiple currencies
Euro currency support	Support for the pending European Monetary Union

For Oracle Applications Version 11, due at the beginning of next year, Oracle is adding support for the European Union's euro currency, along with global consolidation and centralized transaction approval systems. Oracle also plans to add functions specific to Eastern Europe and Latin America. The new application package will bring to 40 the number of countries with local functionality in Oracle's software and to 28 the lan-

Oracle, page 60

PLATFORMS

HP's 64-bit Unix serves high end only

By Jaikumar Vijayan

WITH THE RECENT shipping of its HP-UX 11 operating system, Hewlett-Packard Co. has become the latest vendor to gain bragging rights to a full 64-bit architecture.

But firms are unlikely to find an immediate need for all the capabilities the environment brings, except in high-end applications areas such as data warehouses and large online transaction processing, analysts said.

"It is currently only a high-end need. We don't see [64-bit technology] moving into the midrange within the next couple of years," said Greg Weiss, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

The Palo Alto, Calif.-based HP started shipping the latest version of its Unix operating system on Sept. 15. With it, HP

HP, page 60

HP offers 64-bit Unix

CONTINUED FROM PAGE 59

became the latest in a growing list of vendors that offer 64-bit platforms that include hardware, software and supporting applications.

Digital Equipment Corp. was first out with a 64-bit offering more than three years ago. Since then, Silicon Graphics, Inc. and Sun Microsystems, Inc. have jumped on the 64-bit bandwagon. IBM's proprietary AS/400 also supports 64-bit computing, but its Unix servers don't support it fully yet.

One of the biggest draws of 64-bit operating systems is its support for large file sizes and Very Large Memory (VLM). Although 32-bit operating systems support file sizes of less than 2G bytes, 64-bit systems such as HP-UX 11 support files up to 1T byte. HP's operating system also supports up to 16G bytes of main memory.

Such features substantially boost application performance, especially in transaction-intensive environments, analysts said. VLM support, for example, lets administrators run entire databases directly on the main memory rather than having to access records from disk storage systems.

Taken together, the increased scalability and speed provided by 64-bit technology can make large applications fly, said David Krauthamer, MIS manager at Parker Hannifin Corp., an auto parts retailer in Rohnert Park, Calif.

"On the positive side, there is a significant speed impact" from 64-bit architectures, Krauthamer agreed. "But to take full advantage of it, all your supporting application software must also support 64-bit" technology.

FILLING A NICHE

Also, such capabilities are really needed only when running very large applications, observers said. Many existing Unix application environments — and even newer ones such as SAP AG's R/3 or The Baan Co. enterprise resource planning applications — haven't yet begun pushing the 32-bit performance envelope, analysts said.

"64-bit Unix has not been a big driver for us. We are not maxxed out on Unix performance yet," Krauthamer said.

And although many software vendors such as Oracle Corp. and Sybase, Inc., have announced support for 64-bit architectures, there are still relatively few software vendors that ship 64-bit applications, Weiss said.

But current users of 32-bit applications will get some immediate benefits from HP's latest Unix release.

HP claims that performance of some of those applications can be boosted significantly under HP-UX 11.

FEATURES OF HP-UX 11

- 64-bit architecture
- Support for Very Large Memory
- Support for up to 4T bytes of physical memory
- Ignite/UX administrative tool for easier deployment of HP-UX servers
- Software Distributor/UX for enterprisewide software distribution
- Java-based System Administration Manager
- Dynamic processor and memory resilience for diagnosing and correcting failed processors or memory

Features such as increased memory support, high-speed data backup and fibre-channel support can boost performance and scalability of existing 32-bit applications, said James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H. □

E-mail spreads viruses

CONTINUED FROM PAGE 59

list of known virus "signatures." The newer technology is called heuristics.

Most major vendors have either unveiled heuristic products or have announced plans to develop them. Last week, for example, Symantec Corp. in Cupertino, Calif., released Norton AntiVirus 4.0 that includes the company's Bloodhound virus-seeking technology. Until now, Bloodhound was used solely in Symantec's own World Wide Web spider that searched the Internet looking for new viruses.

Symantec officials said Bloodhound will detect more than 90% of macro viruses and 80% of other types when used unaided, although it is coupled with conventional signature checking to increase accuracy. Signature checking is much more accurate for known viruses, often 99% or higher, but useless for new viruses unless they are a close variant of one that is known.

HEURISTICS CHALLENGE

The challenge with heuristics isn't necessarily finding dangerous new macros, but preventing false alarms. That's already a problem with some conventional antivirus software.

"We've had quite a few people call in — their virus detections are alarming all over the place," said William Orvis a member of the Computer Incident Advisory Capability team at Lawrence Livermore National Laboratory in Livermore, Calif. The team provides computer security services to the Department of Energy.

But the benefit of using heuristics is that it eases the never-ending problem in the antivirus world: the battle to be up to date. With signature checking, antivirus firms must find a virus and then find some "signature" code to identify it and develop a way to clean it. McAfee Associates, Inc. in Santa Clara, Calif., expects to ship a heuristics-based product by Oct. 15.

Goddard recalls early heuristics efforts that targeted older boot-sector viruses, which infected machines booted from victimized floppy disks and which could do everything from pop up a message to wipe out a hard drive. "It never seemed to be terribly effective," he said. However, he said he believes newer versions might prove more useful. In any case, he added, "it certainly can't hurt."

Automatic Data Processing ICS in Edgewood, N.Y., was hit hard by the Concept Word macro virus earlier this year, wasting a good deal of staff resources cleaning up after it, said LAN administrator Dany Richard. Now, though, Richard said he believes antivirus software — his company uses McAfee products — is helping get the problem under control. □

Central data boosts sales

CONTINUED FROM PAGE 59

The company took its new system a step further by integrating Aurum's software with its existing SAP America, Inc. electric and gas management system, so company employees also have access to back-end billing and financial information and customer history on one database.

The sales force project is an effort to stay competitive in the increasingly heated utility business. "We don't have much of a choice here," said John Keast, chief information officer at PG&E. "If we want to provide broad customer experience [to salespeople], then we need to have these systems," Keast added.

Rob DeCisto, an analyst at Gartner Group, Inc., said Aurum is the first company to combine interactive selling tools with contact management tools used by salespeople to plan and track sales. A salesperson has access to product information, a proposal tracking system, marketing data and an order-management system using one graphic interface.

Using one system instead of several can significantly lower cost of ownership and speed up system installation, DeCisto said. Other sales force automation vendors, such as Trilogy Corp. in Austin, Texas, may focus on one part. Trilogy offers interactive selling tools.

Aurum last week made three product announcements including the following:

- Customer Enterprise 7.0, which includes software applications for sales, customer service and marketing. The upgrade includes the addition of the Aurum Workbench, tools that can be used to more quickly change the user interface and database on Enterprise 7.0 without reprogramming.
- Interactive Selling Solution, a World Wide Web-based system that uses a search engine and knowledge base to best determine a product for a customer. The system also includes an electronic marketing catalog and quote proposal generator.
- Enterprise Integration Server, client and server products that connect Aurum with back-office systems, including legacy systems, Oracle, SAP and The Baan Co., which recently acquired Aurum. □

Oracle targets multinationals

CONTINUED FROM PAGE 59

guages the software supports.

Analyst Ed Black at Aberdeen Group, Inc. in Boston said that although many companies can handle transactions for individual countries with currency- and language-specific functions, it is increasingly important to install software systems that handle global functions that let users see the big picture. Vendors are picking up on that trend.

"There is a lot more to understanding, measuring, consolidating and managing a multicountry operation than showing screens in a given language," Black said. "Companies are asking, 'How do I get a consistent view across borders?'"

Besides Oracle, Pleasanton, Calif.-based PeopleSoft, Inc., which is behind Oracle in the international market, also recently announced new multinational and globalization functions for its software. Market leader SAP AG, based in Germany, has been leading the drive toward global functionality.

Al Capuano, a project manager at Subaru of America, Inc. in Cherry Hill, N.J., said his office likes what it sees so far in Oracle's Version 11 but will move slowly to adopt it.

Capuano said his office likes to keep up with current versions of the application package — Subaru is installing Version 10.7, released in the spring. But the automaker wants someone else to be the test case for Version 11.

"We don't see putting Version 11 in until the fourth quarter of next year," Capuano said. □

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Intel Corp. today rolled out a combined LAN adapter and 56K bit/sec. modem for notebooks. The Pro/100 LAN+Modem56 PC Card combines a 10/100M bit/sec. Ethernet adapter and a 56K bit/sec. modem in a single PC Card, eliminating the need for users to swap out LAN and modem cards. The adapter supports Rockwell/Lucent's K56flex technology and will be upgradable to the future 56K bit/sec. standard. The Pro/100 LAN+Modem56 PC Card is available immediately for about $369.

Low-cost bar coders save for small users

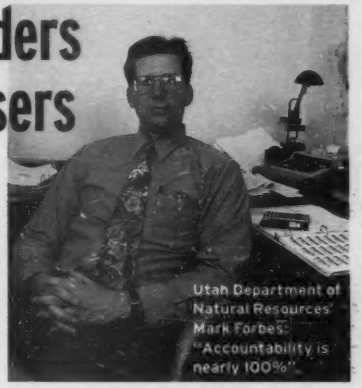
By Nancy Dillon

SOON AFTER Jason Koch was tapped to use his computer skills to track his store's inventory of 5,000 wireless communications accessories, he decided to scrap a manual data entry system and buy a small-business bar-code package.

At the time, Koch was working in retail at a 360° Communications Co. store in Durham, N.C.

Before the bar-coding system was installed, two store employees would spend half a day each week counting every telephone, battery and pager in the store by hand, Koch said. "I took that job and made it a cinch with only about a $500 investment."

The bar-coding system will save the retail store an estimated $10,000 annually. "It has cut down on employee theft, inaccuracy with orders and has saved us from losing customers due to product shortages," Koch said. The system is now in place at two more of the company's retail stores in North Carolina.



Utah Department of Natural Resources' Mark Forbes: "Accountability is nearly 100%".

And Koch has been promoted to network technician at the corporate office in Raleigh, N.C.

The Utah Department of Natural Resources in Salt Lake City has implemented bar-code systems at each of its major offices and state parks to track thousands of small-asset resources such as PCs, binoculars and calculators. Mark Forbes, a project analyst at the department, said the system will save the department $50,000 to $100,000 per year.

"Now we're able to assign equipment to specific individuals and know who has what at all times," Forbes said. "Accountability is nearly 100%."

Koch and Forbes purchased the same system from Zebra Technologies VTI, Inc. in Sandy, Utah.

The off-the-shelf system Koch bought included a bar-code scanning wand, a database and software that reads and prints

Bar coders, page 66

Briefs

IBM pilots WorkPad

IBM last week announced it will make the IBM WorkPad, a pocket-size PC companion that uses 3Com Corp.'s PalmPilot technology.

The WorkPad weighs 6 ounces, has 1M byte of storage and provides users with access to their address book, calendar, scheduling, memo pad and expense functions. It is powered by two AAA batteries. An optional modem offers electronic-mail or Internet connectivity. The WorkPad costs $399 and is available immediately.

New RAID controller

Mylex Corp. in Fremont, Calif., this week will announce a new storage controller that promises to more than double storage system performance to 2,400 I/O operations per second.

The DAC960PJ, a RAID 5 controller, will target high-end servers and disk systems. It will ship early next year at prices ranging from $1,050 to $1,350.

Maxspeed jumps on NT

By April Jacobs

MAXSPEED CORP. in Palo Alto, Calif., is joining the multiuser Windows NT bandwagon to provide thin-client users with another option to access traditional PC applications.

The company is taking on other vendors in the market such as Citrix Systems, Inc. in Fort Lauderdale, Fla., and Microsoft Corp. in Redmond, Wash. Citrix already offers third-party NT access software dubbed WinFrame, and Microsoft plans to offer multiuser capabilities next year with the release of Windows NT 5.0, code-named Hydra.

> "We are looking for options ... that will allow us to run our old 486s."
> – Larry Garden, Brewers Retail

Besides giving terminal and network computer users access to PC-based applications, users say multiuser NT, which runs on the server, not on a client, also can help lower a desktop's cost of ownership because it is maintained centrally.

"I think some people are interested in multiuser NT because it allows them to administer applications from the server, and they can put older PCs to use without having to worry about compatibility or performance issues," said Larry Garden, manager of technical operations at Brewers Retail, Inc. in Mississaugua, Ontario.

"We are looking for options like this that will allow us to run our old 486s, because I have a closetful of them just sitting there waiting," Garden said.

Maxspeed's MaxStation software lets multiple users access one NT server through multiport controllers. Priced at $650 per user license, the software is available now.

Analysts say Maxspeed may have a tough time breaking in to the multiuser NT business because of the strong relationship between Citrix and Microsoft and Microsoft's own plans to offer a product next year. In May, Microsoft signed a $75 million licensing deal to fold WinFrame into Windows NT starting with Version 4.0 [CW, May 19].

"This is a relatively mature market where no one has made any inroads against Citrix, and it will be very difficult for anyone

Maxspeed, page 66

COREL'S VIDEO NETWORK COMPUTER

Processor:	233-MHz Digital StrongARM SA-110
Memory:	32M bytes
Virtual cache:	500M bytes to 1.4G bytes
Network interface:	Ethernet 10Base-T, 10/100Base-T, V.34 and V.80 modem
Display:	VGA/SVGA/XGA
Video RAM:	2M bytes

Corel makes risky NC move

▶ *Video Network Computer pushed as 'ultimate appliance'*

By Gordon Mah Ung
OTTAWA

WHEN Corel Computer Corp. unveils its Video Network Computer (VNC) next month, it won't be just another network computer, the company promised. But some observers are skeptical — concerned that a network computer effort moves Corel away from its software core.

Pushing the VNC as the "ultimate communications appliance," Corel Computer, a recently formed subsidiary of software maker Corel Corp., said its network computer will incorporate the highest performance of any network computer yet and offer videoconferencing over a LAN and Internet telephone capabilities.

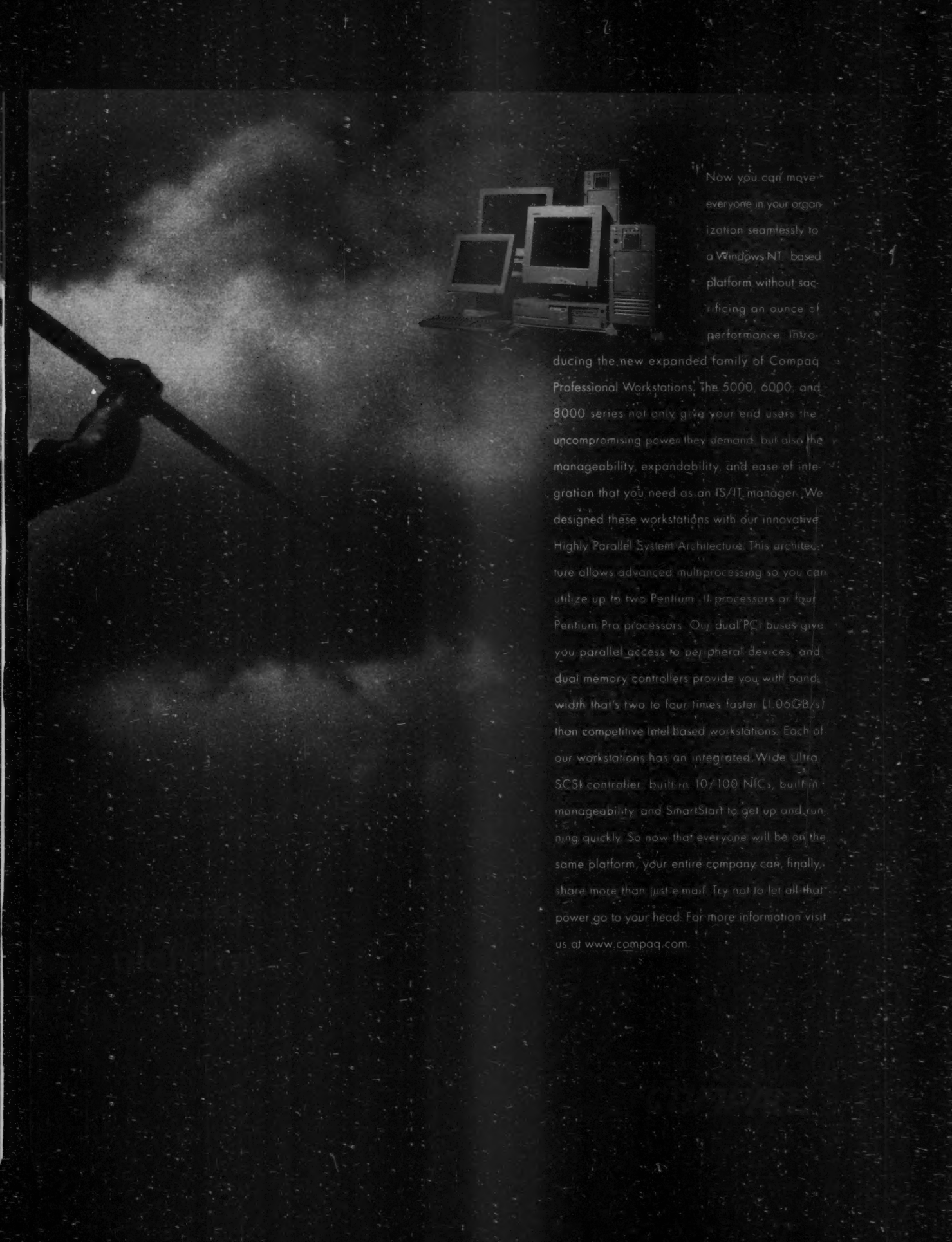
Although Corel wasn't able to show a working model of its network computer, officials spelled out the specifications for a machine they said will say "high power" to users (see chart).

Based on Digital Equipment Corp.'s StrongARM 233-MHz RISC processor, the VNC supports a host of network protocols, comes with 32M bytes of memory and a hard drive that ranges from 500M bytes to 1.4G bytes.

This is the second version of a Corel VNC. A previous prototype based on a Motorola, Inc. PowerPC processor didn't meet the company's expectations for performance and was scrapped. Corel said benchmarks by Digital show a StrongARM-based network computer prototype easily outpaced a 200-MHz

Corel, page 69

MMX
intel inside
pentium II



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Low-cost bar coders pay off

CONTINUED FROM PAGE 63

bar codes. "Almost everything we sell comes with a bar code on it," Koch said. "With our bar-code tracking system, we run the wand across the product, enter the number of units to add or delete and press enter." With the system in place, store employees can access the inventory database at any time to run customized reports for reordering.

Tom Ryan, an analyst at Gartner Group, Inc. in Stamford, Conn., said shrink-wrapped bar-code packages are a good fit for five-person warehouses that process 100 to 200 orders per day. "No matter who you are, if you're worried about asset management, you have to use bar coding," Ryan said. "You don't want 'Fat Freddy' typing in the numbers, because he can't type."

Ryan said small-business packages offer good return on investment for less than $1,000. But warehouses that have multiple sites or more than 100 people might require customized warehouse management systems.

Companies such as TanData Corp. in Tulsa, Okla., provide those specialized systems, Ryan said, "but they can cost anywhere from $200,000 to $3 million."

Zebra recently released an update to its Barcode Anything package. The new version works with any Windows-based PC and printer and includes a scanning wand and new tracking software built on a Microsoft Corp. Access database. It costs $299.

Two more companies that offer small-business bar-code packages are CoStar Corp. in Greenwich, Conn., and Eltron International, Inc. in Simi Valley, Calif. □

Maxspeed

CONTINUED FROM PAGE 63

to compete," said Steve Kleynhans, an analyst at Meta Group, Inc. in Stamford, Conn. But the market is relatively promising, according to Rob Enderle, an analyst at Giga Information Group, Inc. in San Jose, Calif. Enderle said about 10% to 20% of NT licenses will be based on some form of multiuser Windows NT by the end of 1999.

Users of multiuser NT may be able to run many applications from a central location — making them easier to maintain, Enderle said. They also may be able to lower their cost of desktop maintenance because they can troubleshoot software-related problems remotely.

But a downside is that the network must be extremely reliable and have enough bandwidth to support multiple users accessing files and applications over the network. Also, if the network goes down, users are left virtually unable to work, Enderle said. □

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SHORTS

Zephyr offers Passport

Zephyr Development Corp. in Houston has announced the Passport TN3270E Client for Windows 95/NT, host access software.

Passport connects users to IBM mainframe and midrange systems using an interface similar to Microsoft Corp.'s Office suite, a customizable keypad and support for connections to multiple hosts. Passport costs $149.

Pumping PC power

Intel Corp.'s Mobile Power Initiative, a committee of hardware and software vendors, last week met to study how to provide pumped-up video and graphics capabilities on laptops while preventing overheating.

The group's goal is to push notebook power consumption to less than 25W, while using faster processors, DVD-ROM drives and full-motion video. The group is expected to hammer out final standards by Oct. 13.

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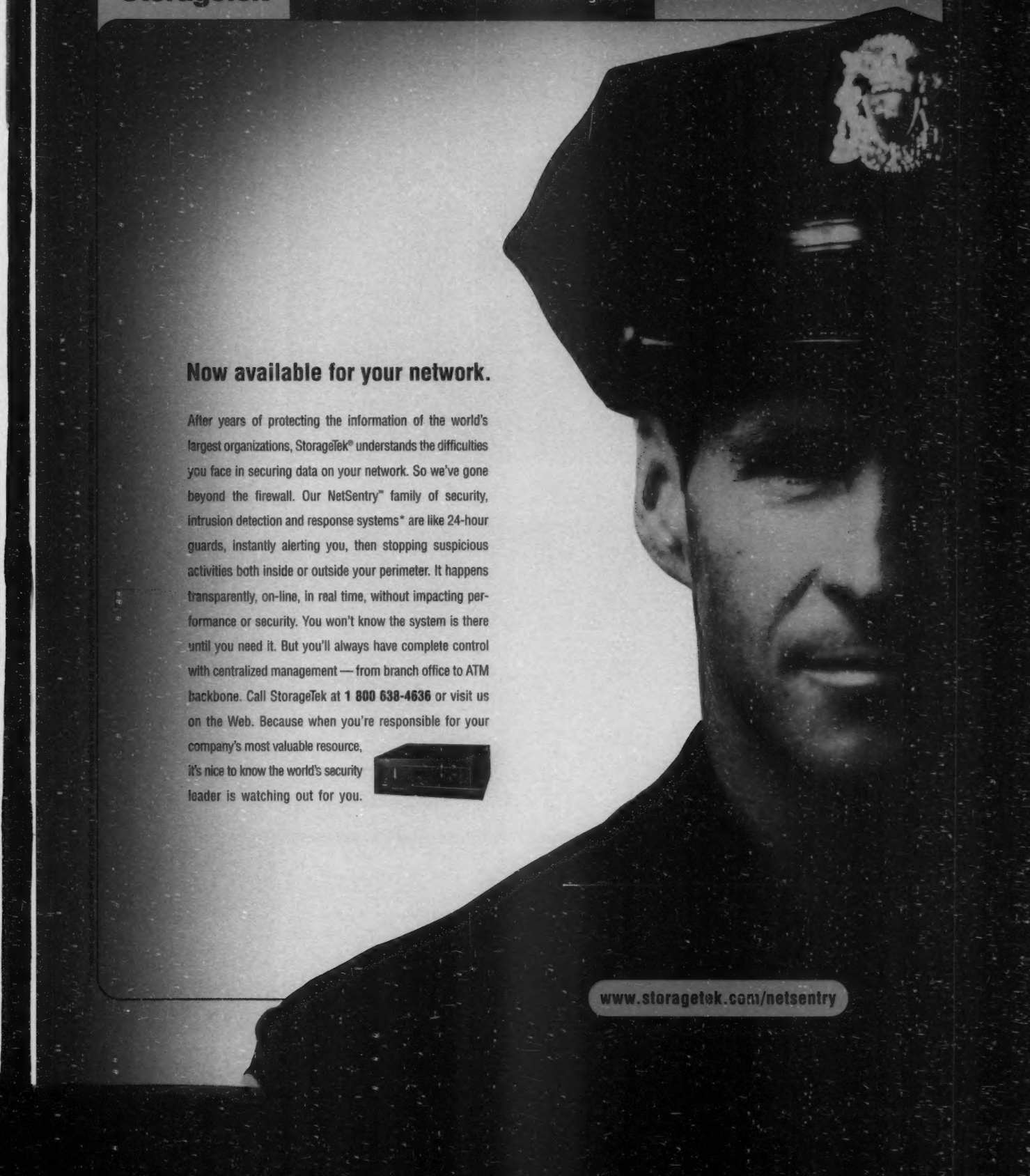

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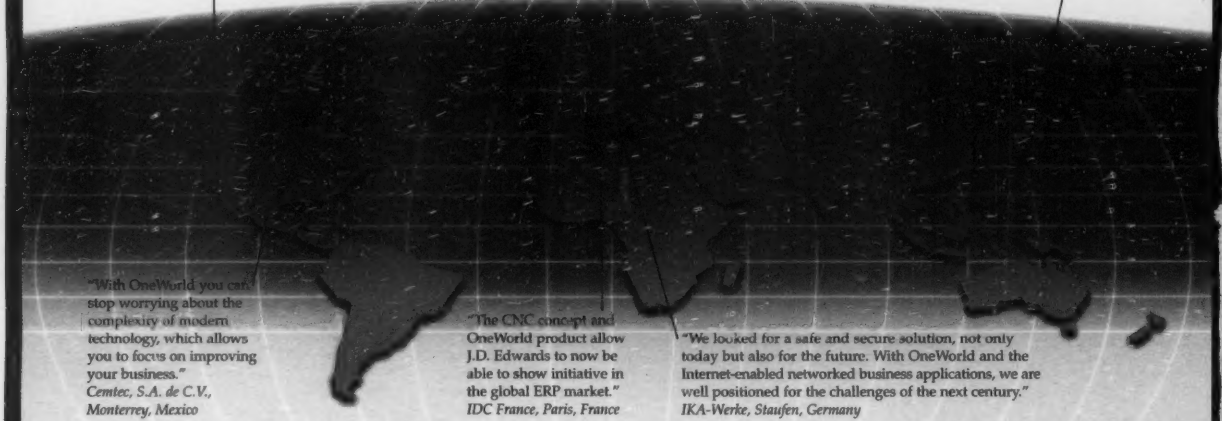

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Sunny Days Come to the

"Dark Side"

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by Virginia Brooks

DIRECTOR OF NETWORK RESEARCH
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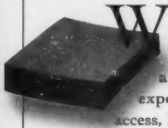

Whenever one enterprise communications manager talks about his company's experience with remote access, he begins, "Our journey to the 'Dark Side' began in 1985."

Back then, accessing desktop data remotely really was the dark side. It held all the uncertainty of a trip to the moon. It was the province of a few brave souls who recognized the tactical value of accessing applications while on the road and were willing to wrestle with the constraints of slow modems, analog phone lines and home-grown terminal emulation programs.

Remote access has come a long way. In late 1995, it began to appear on the strategic considerations lists of IS executives. Today, remote access networking is a $4.5 billion market. There are 11 million telecommuters in the U.S., and nearly 55 million users will take advantage of remote connections by the year 2000.

Internet access has been the force driving this boom, but there are other factors: vast leaps in portable computer processing power, zippier modem speeds, an increasing array of bigger-bandwidth options and an expanding library of applications. In addition, stricter environmental regulations (which require reductions in the commuting workforce), increasing real estate costs, the expense of relocating workers and employee quality-of-life issues have all spurred the adoption of telecommuting.

Many applications have helped popularize remote access: sales force automation, help desk, intranet access, web browsing, software upgrading and data conferencing. But the #1 reason employees want remote access is e-mail. Companies that do not provide corporatewide anytime/anywhere e-mail access for their workers are at a competitive disadvantage.

Aberdeen divides the remote access marketplace into four user segments: the enterprise, the small office/home office (SOHO), the individual remote user, and Internet and online service providers.

The enterprise has extended its reach to telecommuters and branch offices needing to connect to the enterprise network. This segment also includes independent branches that communicate among themselves in a peer-to-peer configuration or several satellite sites attached to a larger branch office.

The enterprise's growing dependence on Internet/intranet applications requires scalable, flexible, robust solutions that deliver higher throughput, traffic engineering and support for quality of service. Management of both established and emerging technologies is critical. Enterprise remote access requires support for legacy environments, enhanced security, protection of network investments and lower administrative costs and costs of ownership.

CIOs will invest in solutions that encompass the entire corporation's remote access needs, from the simplicity of a single remote user to the complexity of full enterprise connectivity. Remote access solution providers such

as Cisco Systems, 3Com/U.S. Robotics and Ascend, and internetworking vendors such as Bay Networks, are extending their product lines at both the high and low ends to meet the needs of the enterprise. As a result, modem pools have given way to access concentrators that can support hundreds of users and can offer management capabilities, while low-end access devices provide higher speed connectivity and are easier to install.

The fastest growing remote access segment is the **SOHO market**, which requires dial-up connectivity to public networks such as the Internet. Users here may also desire connection to a virtual private network (VPN) for information exchange. To these users, who often have little technical expertise, ease of use is critical.

The **individual remote user** has been the foundation of the remote access market. Usually non-technical and lacking support resources, this user relies on solutions that include ease of use, good performance, interoperability and security.

The clamor for Internet access has spurred furious growth in **Internet and On-line Service Providers (ISPs)**. ISPs are the true builders of the bridge between the worlds of data and telephony. They introduce technologies and services into the remote access arena, and move with a speed that is totally alien to the telco way of doing business.

Service providers are building large scale, homogeneous public remote access networks. Such networks are required to be robust and reliable, to insure availability of service, scalability, connectivity choices and solid management capabilities.

ISPs can no longer simply offer barebones access. Content and value creation, rather than mere connection, have become a requirement. ISPs can reduce the time they spend building and expanding their infrastructure by finding scalable, pre-integrated solutions that permit economical deployment of multiple points of presence. One such offering is Cisco's AccessPath, a stack-based carrier-class system that integrates dial access with call processing, backhaul routing and management.

Bandwidth has always been THE remote access issue. Trying to transmit applications that require LAN connectivity speeds at rates of 9,600 and 14,400 bps is not a pleasant experience. Demand for better access bandwidth hit critical mass once the Web became part of daily life, spurring faster connectivity for remote users. In the past year, there have been some big leaps forward.

There are two flavors of 56K modems: x2 from 3Com/U.S. Robotics, and K56Flex, being developed by Rockwell and Lucent. The two technologies are not compatible, and the battle between the camps is raging.

USR claims that more than 600 ISPs have agreed to support x2 and has made deep inroads in the retail channel; it's hard to walk into a computer store and not trip over the stacks of x2 boxes dominating the modem section.

While USR was lining up ISP support, the vendor and modem manufacturing communities endorsed Rockwell's technology, thinking that K56Flex would be more solidly engineered. Realizing that the last thing needed was another competing standard, Lucent combined its efforts with Rockwell's to bring some interoperability to the market. Rockwell ran into problems with its chipset and has been slower to market than USR. Also, compatibility issues among the variations of K56Flex have made the protocol a bit trickier to support.

DEMAND FOR BETTER ACCESS BANDWIDTH HIT CRITICAL MASS ONCE THE WEB BECAME PART OF DAILY LIFE, SPURRING FASTER CONNECTIVITY FOR REMOTE USERS.

Potential users of either modem type need to consider a few things. The 56Kbps speed is available for downloading only. Because the FCC has put a 53Kbps limit on the downstream data transfer rate, throughput will not attain 56K. Varying quality of the local phone loop results in downstream data rates in the 40K-50K range (still a big improvement over a 28.8K connection). Upstream transmission tops out at 33.6K, so don't expect blazing transmission speeds back to the ISP or corporate access concentrator.

Since there must be a compatible modem at the terminating end of the connection, users must know which technology their ISP supports before buying a 56K modem. Also, be aware that limitations on 20% of U.S. phone lines prevent them from transmitting at higher speeds. And once a standard is agreed on (probably

TAKE MY REMOTE ACCESS . . . PLEASE

IT managers dread the middle-of-the-night page from a user on the road who can't get in to the network. Complaints about busy modem pools and creeping speeds for intranet access. Unrelenting technology churns.

They long to hand over remote access to someone else so they can focus on their real job of getting technology to serve the business needs of the company. No wonder more firms are outsourcing remote access. What IT manager, given sufficient security guarantees, wouldn't let someone else deal with remote access headaches?

The timing for outsourcing remote access couldn't be better. Remote access is getting too complicated. Enterprise IT does not have in-depth understanding of the WAN side of the equation. Service providers are searching for ways to differentiate themselves and mine new sources of revenue. Private networks such as the RemoteLink Service from Concentric Data Systems will offer a speedier alternative to the sluggish Internet.

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sometime next spring), all modems will most likely require some type of upgrade. Fortunately, modem makers and vendors are willing to provide these upgrades at no charge.

ISDN keeps chugging along.

Internet access jolted the telcos into active ISDN deployment; now all the RBOCs offer it. (They've installed on average about 90,000 BRI and 2,000 PRI lines since June 1996.) Even the Baby Bells who haven't pushed it aggressively have seen their ISDN line count double. But there's still no consistency in ISDN availability and pricing — even from the same telco. It's common to wait several months for ISDN service, and in the less metropolitan areas, ISDN may not be available until 1999.

Much of the credit for the availability of ISDN goes to networking hardware suppliers like 3Com, who tried to make the line ordering and equipment installation processes as painless as possible. Due to these efforts, ISDN has made inroads not only with large corporations but also small businesses, which often lack the luxury of IT support. But service and support from telcos ranges from excellent to a low level of understanding about the difficulties that can beset ISDN lines.

Despite the challenges, businesses have not shied away from ISDN, and are migrating from BRI to PRI. The technology is mature, standardized, generally available in the U.S. and prevalent in Europe and Asia. For the near future, ISDN will continue to be the most practical solution for high-speed remote access.

Today's most talked-about access technology is Digital Subscriber Line.

DSL uses existing local loop copper telephone wire connections between a user and a central office to create high-speed network access links. It is the local loop, (called the "the last mile" in telcoese). Some 95% of the 700 million copper wire access lines that connect homes and businesses worldwide to a central office are single twisted pair and could support DSL, creating a vast opportunity to speed up access transmission without having to pull new wire.

The choices of DSL technologies are confusing (see chart, p. 7). Aberdeen thinks ADSL will be most widely adopted. Having completed its trial phase, it is now available in some parts of the U.S., but will not hit critical mass until year 2000.

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Users report positive experiences with ADSL. Equipment has been reasonable to configure. Connectivity speed has increased dramatically. Users do not find its asymmetricality a hindrance as long as they are receiving more than they need to give from a data perspective.

The real issues will be based on how the carriers deal with pricing, marketing and deploying DSL. There is concern the telcos have not learned from their experience with ISDN.

How much bandwidth is truly adequate for remote connections depends on the applications. Since simple e-mail does not require much bandwidth, it can comfortably be accommodated with 28.8K modem access. But once attachments that contain Powerpoint presentations become part of that e-mail, bandwidth needs increase dramatically.

IT needs to examine which applications will be run remotely and from where, to determine the best connectivity choice. Often a business will have multiple connectivity solutions because of regional differences in availability and pricing of services, as well as because of differing user needs.

Server-based remote access (RAS) has resurfaced as a hot topic.

RAS solutions have been around for a while, but they have been overshadowed by more sophisticated hardware solutions for users at small to medium-sized corporations as well as for telecommuters.

Today's open systems remote access servers leverage standards-based operating systems such as NT or NetWare, hardware platforms, communications protocols and direct signal processing modem technology. They compete with hardware-only solutions that are manufactured as fixed-port or chassis-based products on the basis of price, server platform compatibility and the potential to offer greater operating system integration.

The catalyst for the rediscovery of RAS has been the growth of Windows NT, the release of the Steelhead service pack for NT and the development of DSP multimodem server-based cards. Microsoft's first remote access-enabled product, Windows

3.1, contained primitive RAS capabilities. With NT 4.0, Microsoft took a big step forward, adding basic IP and multilink PPP capabilities (and more remote access functionality to come). Aberdeen forecasts that worldwide shipments of server-based RAS ports will reach 27.5 million units by year 2003 and that Windows NT will be the preferred platform for RAS.

Being nominally priced or free, RAS will attract small and medium-sized establishments, small sites of large corporations or large companies with minimal RAS requirements. NT is not a small footprint and works best in a 32-bit environment, which makes it a reach for some smaller users. A common server operating system translates into lower RAS support costs because the RAS server is based upon the same operating systems platform as an organization's e-mail, database, groupware and other servers — a proposition small to medium-sized businesses find attractive.

[redacted]

As companies extend their intranets across WANs, security becomes a concern. To allay fears, suppliers are incorporating firewalls, authentication, IPSec-compliant encryption and VPN tunneling protocols into their new access devices. Aberdeen applauds these efforts, but views remote access security as just one component in a firm's overall security plan, which should include procedural and user education policies as well as technology solutions.

Remote access gives new meaning to the term 24 x 7 x 52. With telecommuters and employees who work at home at night needing network access outside regular business hours, and overseas travelers often connecting to the corporate network in the middle of the night, support is literally a 24-hour proposition. Network managers deploying remote access must ensure adequate support, since most remote users have little technical expertise and often require immediate help. Diagnosing remote access problems is time-consuming, and the fact that IT has no control over the WAN further complicates the situation.

It is common to find fewer than five IT technicians supporting hundreds of remote users. Deploying technicians in the field for on-site intervention is too costly and resource-limiting for most companies. Traditional support methods such as manuals and instructions over the phone are not always sufficient.

Managers of remote users are most effective when they can take control of the remote computing device to perform diagnostics and troubleshooting. Network managers have discovered the value of remote control software solutions such as Traveling Software's LapLink, Symantec's pcAnywhere and Microcom's CarbonCopy for remote support. Such solutions let support personnel take control of a remote user's laptop or PC to remotely diagnose problems and correct them.

[redacted]

In the near term, Aberdeen expects the market for VPNs (making use of the Internet and public WANs for private business) will explode. Savvy equipment and software suppliers are incorporating VPN technology, readying the public network for private use at huge savings. The costs of network service and 1-800 access numbers are rising; VPNs will be driven by the savings that can be realized by dialing the local number of an ISP for worldwide connectivity. As an added benefit, IT managers will be freed from having to support a network of remote users. The public network, in effect, becomes the remote access network. The cost savings will outweigh the concerns of security breaches that can and do occur on the Internet.

Now that the desktop PC has been conquered — or at least tamed — from a remote access standpoint, users will want full access to the office phone system. Bringing the full functionality of the corporate PBX or Centrex to the home or small branch office would enable remote workers to take full advantage of corporate voice functions such as voicemail, call forwarding and transferring, conferencing and even phone paging.

Functionality added to remote access hardware solutions will create hybrid products combining access and networking tasks. Software suppliers will continue to find ways to raise performance and adapt LAN applications for use over the wide-area. Bandwidth will keep growing. And best of all for users, competition will continue to drive prices down.

About the author

As director of network research at Aberdeen Group, a consulting firm in Boston, Virginia L. Brooks tracks internetworking hardware and software. She specializes in remote access, including wireless networking, mobile computing, personal communications services and connectivity technologies. She also works with Aberdeen's supplier clients in market development and assessing opportunities and advises end-user clients on networking trends.

xDSL (Digital Subscriber Line) Technologies

HDSL High-bit-rate	12,000	symmetric	two pair	1.544-2.048Mbps
SDSL Symmetric	12,000	symmetric	single pair	Up to 1.544/2.048Mbps
ADSL Asymmetric	18,000	asymmetric	single pair	1.5-6Mbps downstream 640-640Kbps upstream
RADSL Rate Adaptive	18,000	asymmetric/ symmetric	single pair	adaptive rates: up to 7Mbps downstream; 1Mbps upstream for distances up to 10,000-ft.
IDSL ISDN	26,000	symmetric	single pair	128Kbps

Source: Aberdeen Group

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3.1, contained primitive RAS capabilities. With NT 4.0, Microsoft took a big step forward, adding basic IP and multilink PPP capabilities (and more remote access functionality to come). Aberdeen forecasts that worldwide shipments of server-based RAS ports will reach 27.5 million units by year 2003 and that Windows NT will be the preferred platform for RAS.

Being nominally priced or free, RAS will attract small and medium-sized establishments, small sites of large corporations or large companies with minimal RAS requirements. NT is not a small footprint and works best in a 32-bit environment, which makes it a reach for some smaller users. A common server operating system translates into lower RAS support costs because the RAS server is based upon the same operating systems platform as an organization's e-mail, database, groupware and other servers — a proposition small to medium-sized businesses find attractive.

SECURITY, SUPPORT CHALLENGES

As companies extend their intranets across WANs, security becomes a concern. To allay fears, suppliers are incorporating firewalls, authentication, IPSec-compliant encryption and VPN tunneling protocols into their new access devices. Aberdeen applauds these efforts, but views remote access security as just one component in a firm's overall security plan, which should include procedural and user education policies as well as technology solutions.

Remote access gives new meaning to the term 24 x 7 x 52. With telecommuters and employees who work at home at night needing network access outside regular business hours, and overseas travelers often connecting to the corporate network in the middle of the night, support is literally a 24-hour proposition. Network managers deploying remote access must ensure adequate support, since most remote users have little technical expertise and often require immediate help. Diagnosing remote access problems is time-consuming, and the fact that IT has no control over the WAN further complicates the situation.

It is common to find fewer than five IT technicians supporting hundreds of remote users. Deploying technicians in the field for on-site intervention is too costly and resource-limiting for most companies. Traditional support methods such as manuals and instructions over the phone are not always sufficient.

Managers of remote users are most effective when they can take control of the remote computing device to perform diagnostics and troubleshooting. Network managers have discovered the value of remote control software solutions such as Traveling Software's LapLink, Symantec's pcAnywhere and Microcom's CarbonCopy for remote support. Such solutions let support personnel take control of a remote user's laptop or PC to remotely diagnose problems and correct them.

WHAT'S AHEAD?

In the near term, Aberdeen expects the market for VPNs (making use of the Internet and public WANs for private business) will explode. Savvy equipment and software suppliers are incorporating VPN technology, readying the public network for private use at huge savings. The costs of network service and 1-800 access numbers are rising; VPNs will be driven by the savings that can be realized by dialing the local number of an ISP for worldwide connectivity. As an added benefit, IT managers will be freed from having to support a network of remote users. The public network, in effect, becomes the remote access network. The cost savings will outweigh the concerns of security breaches that can and do occur on the Internet.

Now that the desktop PC has been conquered — or at least tamed — from a remote access standpoint, users will want full access to the office phone system. Bringing the full functionality of the corporate PBX or Centrex to the home or small branch office would enable remote workers to take full advantage of corporate voice functions such as voicemail, call forwarding and transferring, conferencing and even phone paging.

Functionality added to remote access hardware solutions will create hybrid products combining access and networking tasks. Software suppliers will continue to find ways to raise performance and adapt LAN applications for use over the wide-area. Bandwidth will keep growing. And best of all for users, competition will continue to drive prices down.

About the author

As director of network research at Aberdeen Group, a consulting firm in Boston, Virginia L. Brooks tracks internetworking hardware and software. She specializes in remote access, including wireless networking, mobile computing, personal communications services and connectivity technologies. She also works with Aberdeen's supplier clients in market development and assessing opportunities and advises end-user clients on networking trends.

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RADSL Rate Adaptive	18,000	asymmetric/ symmetric	single pair	adaptive rates: up to 7Mbps downstream; 1Mbps upstream for distances up to 10,000 ft.
IDSL Over ISDN	26,000	symmetric	single pair	128Kbps

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REMOTE ACCESS

THE DARK SIDE BRIGHTENS

Corel makes risky NC move

CONTINUED FROM PAGE 63

Pentium Pro at running Java applications.

Corel's plans also call for using the Linux operating system as the basis for the VNC's graphical user interface.

Linux, a free version of Unix, is under constant development and refinement by the global Internet community and is the most open operating system available, Corel officials said.

Corel officials said they want their network computer to overcome typical complaints. For example, users said Sun Microsystems, Inc.'s JavaStation is still slower than a PC when it runs Java applications [CW, Sept. 1].

Although the specifications for Corel's network computer appear to be on target, Greg Blatnik, an analyst at Zona Research, Inc. in Redwood City, Calif., said he wasn't sure Corel Computer and its parent software company, the maker of CorelDraw and WordPerfect, were sticking close to their core business.

"They have been moving in an unusual direction with these products. I think it's unusual for a software company to create client-type hardware," Blatnik said.

"It's very ambitious," he said. "I think the odds are certainly not in their favor. I have to question the kind of focus and use of resources that this may have as an impact on them."

Corel officials said the company has no intentions of opening a factory, but plans to hire another Canadian company to produce the first batch of network computers.

If the demand is there, Corel may eventually turn to overseas manufacturers, such as those that make Corel's video networking equipment.

The initial cost will be about $1,000 without the video equipment, although the VNC will support native decompression and compression of video images. Corel officials said their goal is to get the machines down to $500 each.

The VNC will come with a basic electronic-mail client, World Wide Web browser, Hypertext Markup Language editor and calendaring and scheduling software called Cabot Central. Corel didn't discuss plans to include a reworked version of the parent company's Office for Java. □

NEW PRODUCTS

NSM JUKEBOX has announced the CDR 100 XA and the CDR 100 Recordable, two 16-speed CD jukeboxes that each hold 100 discs.

According to the Bensenville, Ill., company, the jukeboxes support a media exchange rate of 4.5 seconds and are compatible with Unix, Windows, Windows NT, Macintosh, IBM's OS/2 and Novell, Inc.'s NetWare.

The CDR 100 XA jukebox comes with one read-only drive; the CDR 100 Recordable version includes a read/write drive and mastering software.

Both jukeboxes have a combined SCSI/serial interface that controls the data transfer and robotics.

Pricing starts at $5,000.

NSM Jukebox
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www.nsmjukebox.com

POWER COMPUTING CORP. has announced the PowerTrip 233, a Pentium-based notebook computer with MMX technology from Intel Corp.

According to the Round Rock, Texas, company, the notebook incorporates a 233-MHz processor and 16M bytes of RAM. A 12.1-in. SVGA display and a 2.1G-byte hard drive also are included.

The PowerTrip 233 costs $3,599.

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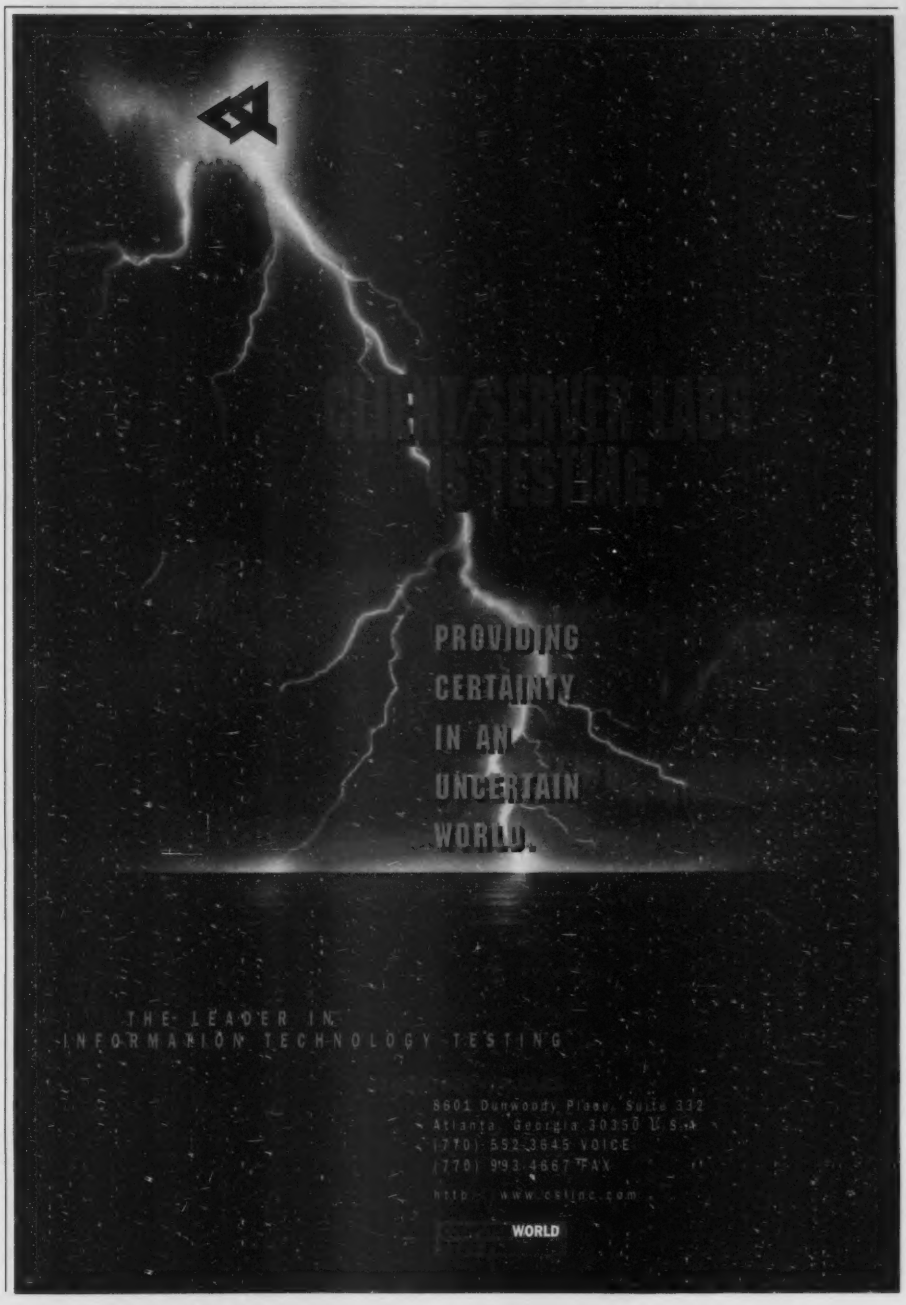

Last word on Three R's
IS managers should focus more on retention than on recruiting, Jim Champy argues. Page 74

Managing

FARMING

WHEN LOC KHUU entered The Chase Manhattan Bank Corp.'s Information Technology Associate Program (ITAP) after graduating from Polytechnic University in the borough of Brooklyn in New York, he already had worked at the bank for four years.

As a high school student, Khuu had been identified by a counselor who thought he was perfect for Chase's Smart Start Program. Smart Start each year targets 40 talented New York high school students who need financial aid. The program provides full scholarships to participating city colleges, book stipends, full-time summer jobs, part-time work during the school year and senior executive mentors.

Upon graduation, students who have maintained the program's scholastic and work standards are guaranteed job offers from Chase.

Smart Start is Chase's farm team: young talent being groomed for jobs in the bank's big leagues. It's one of many tools embraced by companies that are vying for scarce information systems talent and trying to improve upon traditional college recruitment programs.

"Setting up a farm team is not rocket science," says Harvey Daniels, who as a technical recruiter at the American Medical Association (AMA) in Chicago is currently in the process of doing so. "It doesn't take a Mensa membership to understand that we need to do more to feed the candidate pool. Nor is there a single approach."

The AMA isn't alone in being in the planning stages for a farm team. Existing programs tend to be young, most dating from the post-downsizing turnaround of the 1990s. Chase's program is 6 years old, and the current farm team — 28% of whose members are in technology-related programs — was formed from about 1,000 applicants.

UP-FRONT WORK

It takes a lot of work to get that kind of response, says Ray Flautt, Chase's manager of university relations and recruiting. "We advertise the program at local high school fairs," he says. "We have relationships with superintendents of public and private schools. Last year we advertised and went to dog-and-pony shows at high schools."

A Smart Start candidate completes an application that includes an essay, Scholastic Assessment Test scores, high school resume and grade point average. Then there are the interviews. "We stress leadership and interpersonal skills," Flautt says. "We make sure they have very strong communications skills and not just technical skills. They need to be customer-focused and articulate."

It's all worth it, Khuu says. "The best aspect of Smart Start is it gives you a real job experience you normally wouldn't have as a college student. I also got a lot of support and training in presentation and writing skills and in using Excel and PowerPoint — whatever I needed."

During training, Khuu was exposed to a range of technical areas, including WAN management, LAN operations and Lotus Notes administration. "The work experience was all structured to help me develop further," he says. "By the time I graduated, I knew what I wanted to do, so I joined ITAP."

The program, championed by Chase President Tom Labrecque, grew out of a multicorporate initiative to revitalize downtown Brooklyn and reinvigorate its resident Polytechnic campus. Originally, the program supported students at only four Brooklyn colleges, but it has recently been expanded to cover 10 schools throughout the city.

Smart Start has had only two graduating classes, so it's difficult to measure its success. But Chase officials are bullish. "Our belief is that the earlier you identify these folks, the better," Flautt says. "They come in more seasoned. They're better able to hit [the] ground running, and they're more loyal because of the network they have built. They're also familiar with the customs, vision and values of the organization."

But a program such as Smart Start isn't cheap. "You have to know up front that it's going to be very expensive," Flautt says.

And the students — like free agents — can be signed by opposing teams.

About half of those in the first two classes have stayed at Chase. The rest have gone on to postgraduate work or taken other job offers. Of those who took other offers, most were life-science majors, who worked in areas such as physical therapy. They understandably had little interest in banking careers. The program now excludes life-science majors and anticipates even better results, because most of the other graduates who didn't go on to postgraduate work stayed at the bank.

Chase also identifies prospective players through extensive, traditional internship programs with Polytechnic, and its managers work behind the scenes to affect curriculum there. "Some of our key managers have worked with Polytechnic faculty in an advisory capacity for their master's degrees in technology/financial services/business curriculum," Flautt says. "Two or three of our senior managers sit as advisers in that curriculum. They help keep them on track."

Although interns make up many farm teams, some companies have found prospective players right in their own clubhouses. The folks at First Data Corp. in Omaha recently acted on a suspicion that they had an internal farm team just waiting to be developed.

They contracted with a consortium of schools, led by Iowa Western Community College, for an intensive, six-month onsite programmer certification program.

"We had a selection process where First Data people who weren't computer professionals could retrain and retool," says Mark Eibes, staffing director at First Data.

The players lined up to try out. More than 400 applied for 30 places in the first class. Those who made the farm team worked part time at their regular jobs and spent the rest of the day in classes while drawing their full-time salaries. They recently graduated and became entry-level programmers at First Data, Eibes says.

It's too early to tell how successful the rookies will be, but Eibes seems enthusiastic. "The real advantage over entry-level people is they bring First Data knowledge to the job," he says. "There's already a buy-in and

Last in a special series
If you missed the first three parts of the "Three R's" series, you can find them on our Web site at *www.computerworld.com*.

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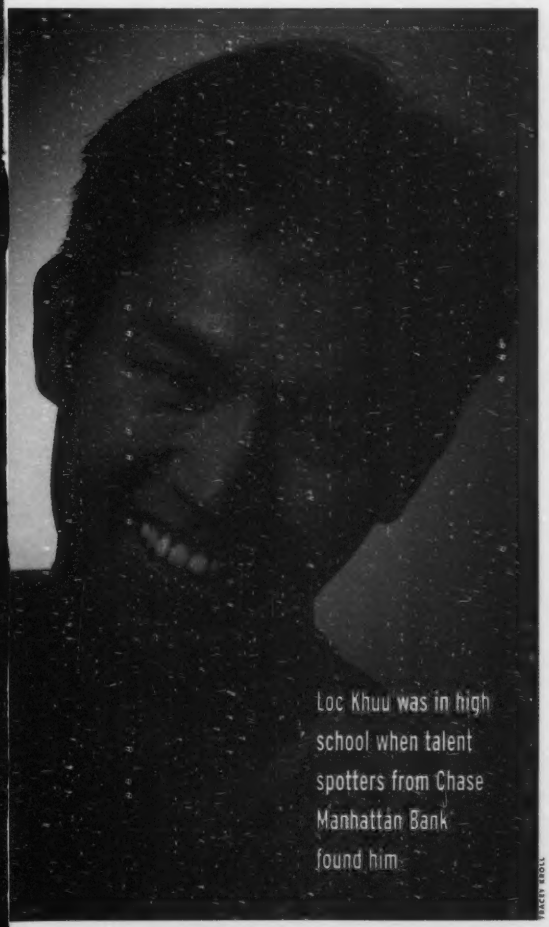
Do you have some thoughts on the retention, recruitment and raiding of IS professionals? Share them this week in a forum at our Web site at *www.computerworld.com*.

Three companies are taking college recruiting a step further: They're scouring colleges — and high schools — to find potential IS talent and create 'farm teams'

FOR THE FUTURE

By Kathleen Melymuka



Loc Khuu was in high school when talent spotters from Chase Manhattan Bank found him.

PEGGY BOLL

loyalty to the company, and we think their applying really shows a commitment to professional growth and development." A second class is being planned.

Meanwhile, First Data also is driving a larger initiative to donate part of a 140-acre downtown parcel for the University of Nebraska's planned Information Science, Technology and Engineering College with a view toward locating its own technical and training people on the campus.

Project leader Vicki Meinhardt says the arrangement will provide a base of potential recruits. "If we're co-located on the same campus with ongoing exchanges through internships and joint projects, they'll be more apt to look to us as an employer in the future," she says.

The agreement is still in the preliminary stages, but plans call for the campus to be ready by 1999.

COLLEGE OUTREACH

If you can't move a university to your company, the next best thing may be to move company resources to the university. Caterpillar, Inc. in Peoria, Ill., has senior people who work full time at each of several universities as part of a recent strategy to strengthen academic relationships.

Robert J. Fenwick is one of those people. As campus manager at Caterpillar's New Technology Department, Research and Development Group, he has worked full time at the University of Illinois for nearly a year. Fenwick manages Caterpillar-sponsored research, coordinates recruiting efforts and works through the Caterpillar Foundation to promote education.

Fenwick's recruiting efforts start at the placement office and move out from there. He hosts student tours of Caterpillar facilities, sponsors interns, speaks at faculty meetings, attends university functions, speaks to classes and champions projects. For example, Caterpillar helped sponsor a car in a recent solar-powered-vehicle race. "It's a way for us to get our name known on campus and to meet the students," Fenwick says.

Caterpillar-sponsored research is one of the primary ways students learn about the company. The research is mostly geared toward solving real problems that the company encounters, so the students are exposed to the kinds of work Caterpillar does.

As a result of those activities, Fenwick says, potential recruits call him at the rate of about one per week.

Caterpillar has other programs that find potential players even before college. "High school interns might work on PC support or rudimentary programming," says Jim Miller, manager of human resources for IS, "and we have a very high success rate in hiring people who have been interns."

Caterpillar's efforts have yielded some excellent players, he says. "We find people who are very capable across the range of technologies," he says. "No technical skills are lacking."

But that doesn't mean they have the finesse of a veteran. "What we're really looking for are people strong in technology with a strong business orientation," Miller says. "We find a fair amount, but not as many as we'd like." To find more, Caterpillar is launching a program to select and train some of its nontechnical workers for technology-related fields.

Miller says Caterpillar's college recruiting came to a halt during the last downsizing cycle. He says he's determined that the current initiatives will be marked by consistency.

"This is a long-term thing," he says. "We want to build solid relationships. If we hit a business downturn and say, 'No more college recruiting,' then this completely fails, because next time we look like the boy who cried wolf."

His advice for other prospective farm team managers: Choose your home base carefully and go the distance.

"Find a place where the institutional values and goals are in sync with yours and you've got the right chemistry with the people involved," he says. "And when times are bad, don't just pack your bag and go away. It's not a spigot you turn on and off." □

Melymuka is a freelance writer in Duxbury, Mass.

Ms. MIS
WOMEN IN INFORMATION SYSTEMS

LOOK OUT FOR Techno-Hazing

Menial tasks and puerile behavior create frustrating, infuriating and demeaning situations for some IS women

BY LAURA DIDIO

IN THIS DAY AND AGE, you wouldn't think blatant gender bias and hazing would be a fact of IS life. But you're wrong.

More women are making their mark in information systems and the computer industry. But some women still grapple with being assigned menial tasks, while their male colleagues with similar backgrounds get choice assignments.

Harassment is a problem in many American workplaces. According to statistics from the Equal Opportunity Employment Commission (EOEC), which deals with all types of job discrimination, women lodged about 15,000 gender bias/harassment claims last year. Eight out of every 10 of those charges were either dismissed with no harassment found or dropped for administrative reasons. The EOEC, which doesn't track harassment statistics by specific jobs such as IS, currently faces a backlog of more than 74,500 cases of all types of discrimination.

Technology organizations aren't immune. The gender bias issue was serious enough to rate an hour-long TV special last March called *Valley Girls*, which was jointly produced by television station KRON in San Francisco and Knowledge TV, a cable network in Englewood, Colo.

KRON's New Media News producer Jan Boyd, who was in charge of the special, says the women in IS had to prove themselves right off the top. Once they did, they made out fine. Still, Boyd says she was amazed at the extent of the gender bias. For example, *Valley Girls* included an interview with Amy Barnett, an former engineer at Apple Computer, Inc. Barnett recalled in the program that a supervisor was assigned to check her design work on a logic chip, but a male counterpart with similar experience had no one supervising his work. The Silicon Valley women profiled in the show even came up with a term for the gender bias: techno-hazing.

WIDESPREAD INCIDENTS

Techno-hazing isn't just in Silicon Valley.

One female IS manager at a large New York brokerage says she was disillusioned by the techno-hazing she encountered immediately upon graduating five years ago. "I was assigned to the IS department, and I thought 'Great, I'm going to troubleshoot the networks and learn all sorts of new things about the latest products and how to do upgrades.' I got a rude awakening."

The IS manager of her department, a 20-year veteran with the firm was "frankly skeptical and contemptuous of my abilities," she says. "He made it clear that if it wasn't for pressure from human resources to hire a woman or minority, I wouldn't be there at all." Instead of being allowed to work on any really meaty problems," the wo-man says she was relegated to menial tasks. "They actually wanted me to just do things like checking monitors," she says.

Meanwhile, a male colleague with a comparable background was right there in the trenches troubleshooting the network. Complaints to her boss resulted in her grudgingly being allowed to troubleshoot — under the supervision of another male network administrator.

"It was frustrating, infuriating and demeaning. I thought about quitting at least 10 times a day, but that's what they were hoping for," she says.

Instead, the woman won over her supervisor with offers to finish jobs for him so he could get home earlier to his wife and kids. One evening the inevitable happened. "There was a network outage — not a big one, just a hardware failure involving some malfunctioning hubs. But I was the only one there at the time, and I fixed it alone," she says. Her grateful supervisor lobbied on her behalf to the still-biased MIS manager. Today, she's an accepted member of the team. "But it took a long time, and I had to swallow a lot of aggression," she says.

Another woman manager had a different but no less demeaning experience when she joined the IS department at a major West Coast legal conglomerate eight years ago. The woman, who asked not to be identified because she's still at the company, said she was the object of blatant sexist behavior.

"I dressed in a professional manner — business suits — and my skirts were above the knee but not miniskirts," she says. "I didn't realize it the first few times, but my male IS colleagues kept asking me to check things out, like cables under the desks or in the ceiling. Any pose that would allow them to look up my skirts. They thought it was a riot."

She found a creative way to stop the techno-hazing, and it didn't involve HR. "I told their wives. I started making jokes about their husbands' fraternity house behavior while we were at the office Christmas party. I never had a problem after that," she says. But for some women, such as Josette Rigsby, an IS manager and webmaster for the city of Richardson, Texas, "zero tolerance" is the only way to deal with techno-hazing. Rigsby, a single mother, simply quit a previous IS job when her former boss consistently ignored her technical know-how and kept asking her to get coffee. □

DiDio is Computerworld's senior editor, LANs and operating systems.

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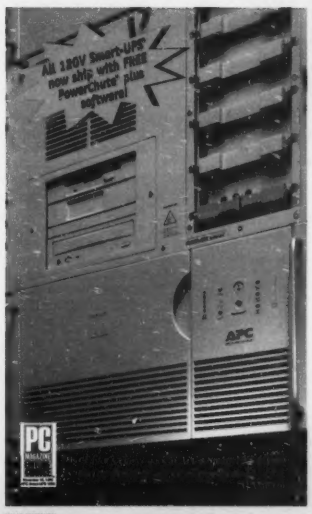

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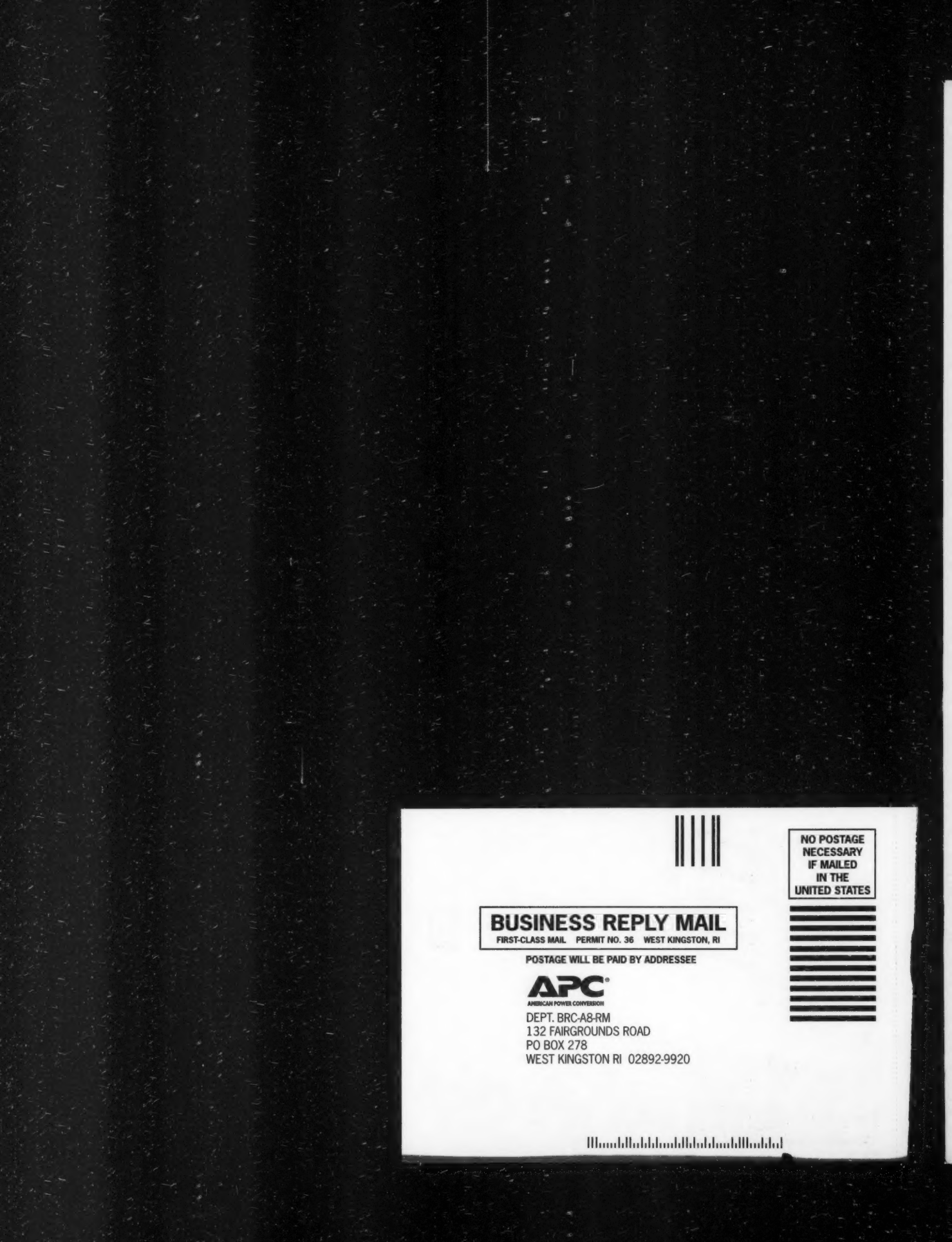
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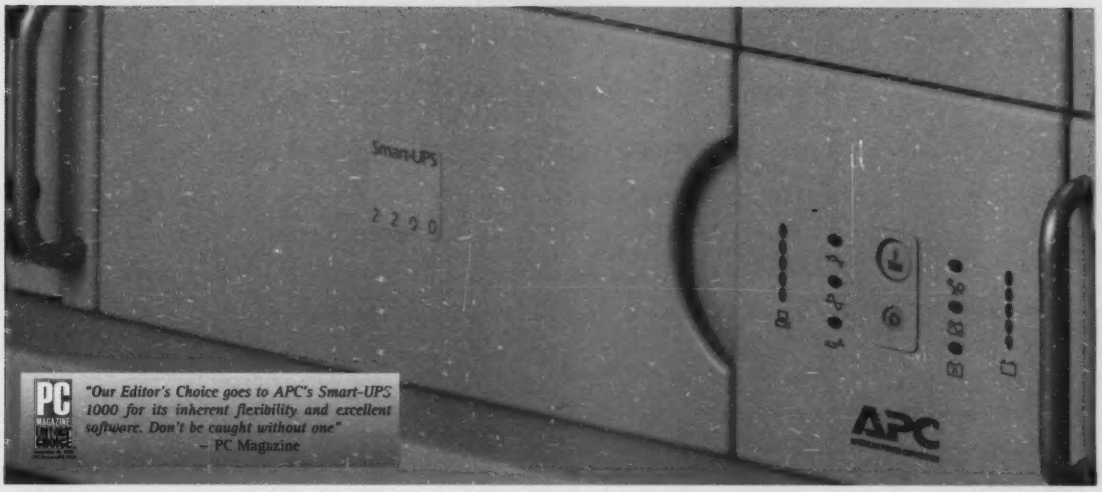

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IT'S NOT WHO YOU HIRE, IT'S WHO YOU KEEP

The shortage of high-tech professionals is becoming critical. By one count, 190,000 such jobs are open in the U.S. But most IS managers put too much emphasis on recruiting.

JIM CHAMPY

What they really should focus on is retention.

Remember that old advertising line, "It's not what you earn, it's what you keep?" Newspapers learned that principle a long time ago: It costs a lot more to replace a subscriber than to keep one. The rule is doubly true with high-tech professionals. The cost of training and getting them knowledgeable about the business can be enormous. And their loss can mean major disruptions in any systems development effort.

Why, then, do we develop elaborate recruitment and search procedures and pay extraordinary recruitment fees rather than stem the outflow of good people? The answer is simple: Most IS organizations have someone who is in charge of recruiting, but no one is directly in charge of retention.

I learned that many years ago while watching a strange ritual at the headquarters of a large insurance company in Boston. The company is well-known for its IS training programs.

That fact wasn't lost on local search firms. Every day at around 5 p.m., recruiters would station themselves outside the company and make job offers to people as they left work. The company took legal action to try to stop the raids. But that wasn't sufficient. It had no choice but to continue to be the best place in which to learn — if not stay.

REWARD THE PERFORMERS

Ultimately, good people stay — and not-so-good people go — if there's a system to separate one from the other. A system that encourages the performers and discourages the nonperformers. That's a task for leadership.

IBM took a stab at "feel-good" retention in its old "no-layoffs" days by appointing a career manager for each employee. That person didn't give performance appraisals but would help guide an employee in trying to achieve his goals. Because there was no linkage between achievement and ambition, the discussions often had an air of unreality. Nevertheless, a person who serves as counselor/ombudsman certainly can help in retention.

One of the best models for retention comes from outside the business world. As explained to me by a former high-ranking Army officer, "In the military, it is the commander's responsibility to take care of new people and make sure they are brought on board in the proper manner. The commander is also responsible for their training, growth potential and retention in the service."

In an environment where your life could depend on the person next to you, the training and screening of troops is taken very seriously. Although the stakes aren't as high in IS, the wrong technical person actually can be more costly than having no one in the position.

The commander as retention officer offers a good model for leadership. It may be the CIO who is accountable for keeping the right people. People leave for multiple reasons: offending cultures, lack of personal development opportunities, loss of faith in the leadership of the business. Those issues can be addressed only by the people at the top.

MONEY TALKS

One other thing: compensation. A Wall Street CIO recently told me his industry suffers high IS turnover because of its "big bang" pay system. In other words, after the bonuses are paid at the end of the year, his employees are raided. I suggested he devise a way for everyone to own a piece of the rock. It can be as simple as an employee stock option plan or a retirement plan funded by the company's stock. It's the only way to offer something unique in compensation, as start-ups have discovered.

Furthermore, companies have fallen way behind in sharing the benefits of productivity improvements. Shareholders have gotten most of the gains. That's very visible to IS professionals, who are often at the center of process-improvement programs. You can fix some of their cynicism by making them shareholders.

Fixing the retention problem requires CIOs to act like real leaders. People are concerned with what the future has in store for them personally, but they also want to be sure that the people at the top know where to take the business. □

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. His Internet address is JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

f.y.i.

Is a CKO worth it?

Knowledge management is becoming increasingly important to information systems, but is it important enough to add to a company's bureaucracy?

A recent study by Ernst & Young LLP found that 52% of 431 executives in the U.S. and Europe think a "chief knowledge officer" (CKO) would have some value to an organization's knowledge management efforts. But only 23% of that group find CKOs very or extremely valuable.

The results don't surprise Gerald Ash, an advocate of chief knowledge officers in Ruskin, Fla. He says knowledge management is an emerging trend that's gaining momentum at the middle levels of most organizations. "The concept of knowledge management has not been high profile at the executive level," he says, so you likely won't find a CKO sitting in the executive suite. But Gordon Petrash, who has been leading Dow Chemical's knowledge management efforts for five years, says a company can accomplish its knowledge management mission without adding to bureaucracy. For example, he alludes to the chemical industry's efforts to preach the mantra of safety following the 1984 accident at a Union Carbide pesticide-producing plant in Bhopal, India. In that incident, a highly toxic cloud of gas killed thousands of people.

Chemical companies put "officers" in charge of safety. But today, there aren't any safety managers because the message has successfully been delivered and integrated, he says.

Petrash says knowledge management should follow the same approach.

CKOs can be "invaluable" as champions of knowledge management, he says, but the CEO must visibly support the effort for the message to be carried throughout the organization.

Kees Been, vice president of knowledge management at the St. Louis-based chemical giant Monsanto Co., says knowledge managers must look at ways to "create breakthroughs" that will boost knowledge management's value in a company.

Knowledge management "is an emerging trend, and one that is moving very rapidly," Ash says. If the survey respondents are asked the same question a year from now, he adds, the results may be very different. — Rick Saia

For MORE network bandwidth, THINK Inside the BOX.

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Executive Technology Summit '97

Solutions Profile: Doing Business with Internet Technologies

During the recent 1997 Executive Technology Summit, held at The Pointe Hilton Resort at Squaw Peak in Phoenix, Arizona, CIO's and other senior level IT leaders from around the globe met and discussed three emerging technologies with some of today's brightest minds. The three technologies portrayed included Distributed Computing; Data Mining and Data Warehousing; and Doing Business with Internet Technologies.

Now in its fourth year, these IT leaders met with peers and industry experts to examine case studies and engage in open and honest dialogue. Within the Solution Lab portion of the program, ETS sponsor Silicon Graphics and its customer SABRE Interactive discussed Travelocity, SABRE's web-based commerce and travel reservation system. The companies provided "lessons learned" from the site including enabling technologies, integration with legacy systems, security, developing a compelling online presence and developing commerce models.

Terry Jones,
CIO
The SABRE Group
www.travelocity.com

THE SABRE GROUP

Challenge

To create a responsive, commerce-enabled web site (www.travelocity.com) that directly connects to one of the largest reservation systems in the world.

Solution

WebFORCE Internet servers from Silicon Graphics, Netscape Communications server software and the Oracle 7 database were the optimal combination to create the world's highest trafficked travel oriented web site. WebFORCE servers combine 64-bit MIPS RISC processors with the highest I/O throughput in the industry. Their revolutionary system architecture and easy upgradeability allows SABRE Interactive to easily scale their site to handle even more traffic. All of which means that Travelocity is getting a lot of mileage out of their Silicon Graphics servers.

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95. Other_____ (Please Specify)

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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. Vice President
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No
Intranet Products ❒ Yes ❒ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
(a) ❒ Internet software
(b) ❒ Internet browsers
(c) ❒ Web authoring/development tools

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70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
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22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. Vice President
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No
Intranet Products ❒ Yes ❒ No

4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)
(a) ❒ Internet software
(b) ❒ Internet browsers
(c) ❒ Web authoring/development tools

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Buyer's Guide

PRODUCT REVIEWS: Are 56K bit/sec. modems faster than 33.6K bit/sec. modems? Not always. Worth upgrading? Probably.
▸Macromedia suite is neat but weighty. Page 82

IN SEARCH OF 56K

BY CHRIS DEVONEY

ALTHOUGH MODEMS MAY always be laggards — limited in speed by telecommunications infrastructure, available technology and legal regulations — two classes of faster modems are clawing their way into the market: X2 modems, which are based on technology from U.S. Robotics (now part of 3Com Corp.), and 56Kflex modems, which are based on technology from Rockwell International Corp. and Lucent Technologies, Inc.

Under the right conditions, both technologies offer download speeds as fast as 56K bit/sec., almost twice the speed of current analog modems. That offers the tantalizing promise of faster World Wide Web browsing and file and program downloading and more productive remote network access.

Ascend Communications' Max 1800

We tested several modems, using two remote access servers and various online services and Internet services. The good news is that 56K bit/sec. modems can speed up most client-side activities, such as Web access and file downloading. When the difference in cost is $40 or less, buying a 56K bit/sec. modem rather than a V.34bis modem makes sense. And some corporations can easily upgrade their dial-in modem pools to the higher speeds for free.

3Com's Total Control, Netserver/16 I Plus modem

However, the two types of 56K bit/sec. modems are incompatible with each other at speeds above 33.6K bit/sec., and a uniting standard from the International Telephone Union (ITU) won't be available until early next year. That means you must make sure you pick the right modem, unless you want to buy two modems, or wait for the standard. If you do buy, you'll want the modem to meet the new standard, which means you shouldn't buy any modem whose vendor doesn't promise a free software upgrade to the eventual ITU standard.

You should also significantly lower your speed expectations. Even in the best conditions, we couldn't connect at rates faster than 46K bit/sec., which is better than 33.6K bit/sec. but not the promised land that the name "56K" implies.

The trick to the new modems is that the data stays in its digital state through the entire telephone network until it's transformed

56K, page 80

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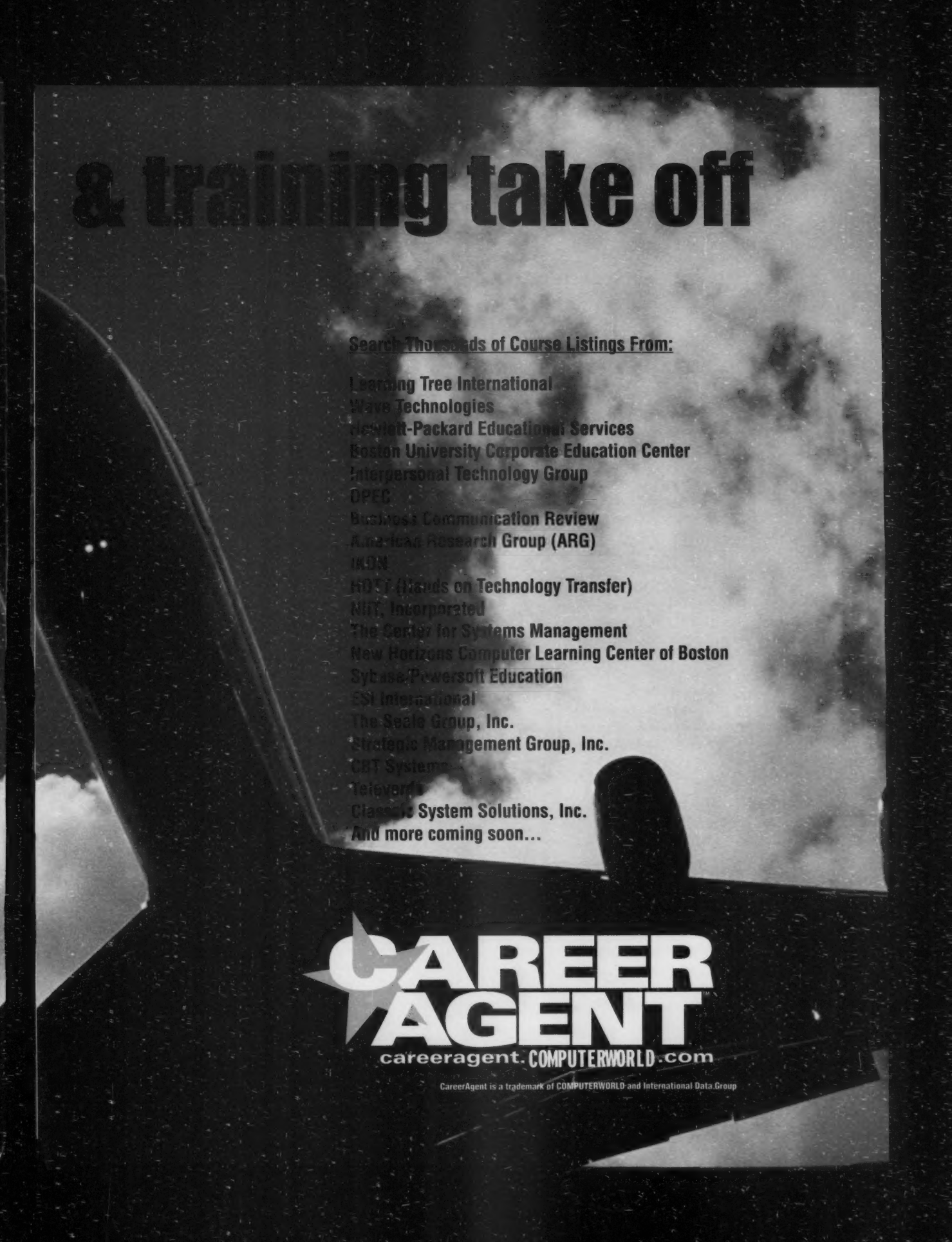
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In search of 56K

CONTINUED FROM PAGE 77

into an analog signal at a telephone company's local switch. Because those digital channels can send up to 56,000 signaling bits per second into the analog channel, you can have an asymmetrical connection in which information can be downloaded to the modem at speeds up to 56K bit/sec., but uploads go at regular analog speeds, which are no faster than 33.6K bit/sec.

SLOWING THE SPEED

Unfortunately, many factors can reduce the 56K bit/sec. speed. Heavy network and switch traffic reduces the rate. Noise, crosstalk, interference or the added impedance from being located too far from the telephone company local switch further reduces the rate. The entire scheme fails if the final telephone company switch is analog (as is the case in some areas of the country) or if the signal goes through more than one digital-analog conversion, such as traveling through a company's or hotel's private branch exchange.

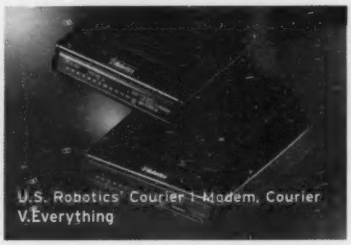
Motorola's 56K ModemSurfr

Both 56K bit/sec. technologies work worldwide and are installed in Mexico, Canada, South America, Europe, Africa, Australia and Asia. But X2 is limited to 53K bit/sec. speeds in the U.S. because of Federal Communications Commission restrictions on power usage.

Xircom's credit-card-size Ethernet 10/100

We gathered X2 and 56K bit/sec. modems from several manufacturers. For X2, we used a U.S. Robotics Courier V.Everything external modem and Megahertz 56K PC Card. For 56Kflex, we used Diamond Multimedia Systems, Inc.'s SupraExpress 56E, Hayes Microcomputer Products, Inc.'s Accura 56K+Fax and Motorola, Inc.'s ModemSurfr 56K external modems and a Xircom, Inc. 56K + 10/100 Ethernet PC card.

After making hundreds of calls using the modems, we found that 56K bit/sec. modems should be called "Better than 33.6K bit/sec., usually." More than 90% of our connections exceeded 33.6K bit/sec., but we never exceeded 46K bit/sec. for 56Kflex and 46.67K bit/sec. for X2. The sweet spot was the mid-40K bit/sec. range.


U.S. Robotics' Courier I-Modem, Courier V.Everything

The X2's modems consistently connected at the same average speed of 43.33K bit/sec., but they never connected at speeds less than 37K bit/sec. Using old modem firmware, the Hayes and Xircom modems wouldn't connect at speeds above 36K bit/sec. With the new modem firmware, the Hayes, Xircom and Motorola ModemSurfr moved the average connection speed up to 44K bit/sec.

CONSISTENCY

Although both types of modems adjust speeds up or down based on changing line conditions, the speed usually remains the same throughout the call. During our throughput tests, we found that the connection speed dropped by 5% or more in about 8% of the 56Kflex connections but only in 4% of the X2 connections. That may mean that the 56Kflex modems are slightly more optimistic than X2 modems when reporting their initial connect speeds.

In practical matters, we did see significant improvements using 56K bit/sec. modems over V.34 modems when downloading files. The most striking difference came when downloading multimegabyte files such as application add-ons or service packs; the wait while downloading those files with the new modems was less painful.

BETTER WEB BROWSING

Most people should also be less frustrated when viewing graphics-intensive Web pages. We found that the 56K bit/sec. modems significantly improved Web browsing. The only areas where 56K bit/sec. modems make little difference was when browsing simple text-based Web pages, which were already fast enough, or when using overloaded online services or Web sites during the early evening hours.

Most router/modem server products sold today using digital lines are 56K bit/sec.-capable, and most servers bought within the past two years are quickly software-upgradable for free or at a modest price. Many companies could quickly switch their internal modem pools from V.34 to 56K bit/sec. technology in a day.

The only problem is with a near-capacity network, which would be further strained by the added 10K to 20K throughput per modem or would reduce throughput to V.34 speeds. Also, keep in mind that you are bound to the 56K bit/sec. technology supported by your server: X2 for U.S. Robotics equipment, 56Kflex for most others. Plan on another upgrade when the ITU issues its final 56K bit/sec. modem standard.

The worst-case scenario involved companies whose dial-in modems connect to analog lines. Both the lines and the equipment must be replaced. In those cases, the cost/benefit analysis must consider that changeover.

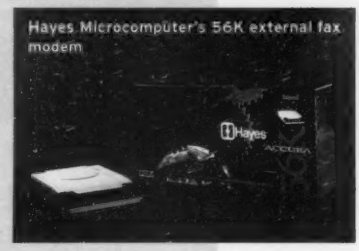
In all, 56K bit/sec. technology can benefit many users. Just don't set your expectations too high. □

DeVoney is a reviewer in Seattle. He can be reached at chrisd@cybercritic.com.

How we tested

For testing, we made hundreds of calls to our own network and to national online services: America Online, CompuServe and The Microsoft Network.

For our local network, we dialed in to a 3Com Netserver 16/1 Plus and an Ascend Communications, Inc. Max 1800 router/remote access server using X2 and 56Kflex technology, respectively, and connected to Integrated Services Digital Network (ISDN) lines. The various X2 and 56Kflex modems were connected to standard analog phone lines, which with our ISDN lines, terminated at an AT&T Corp. 5ESS switch located three miles from our office.


Hayes Microcomputer's 56K external fax modem

To test connection speeds, we used a script running under Quarterdeck Select's Procomm Plus 32 to dial in to our network or online service. The script logged both the connection speed as reported by the modem and the length of time to make the connection. To test throughput, we checked the time to load selected pages at several Web sites and the time to download several small and large files. — Chris DeVoney

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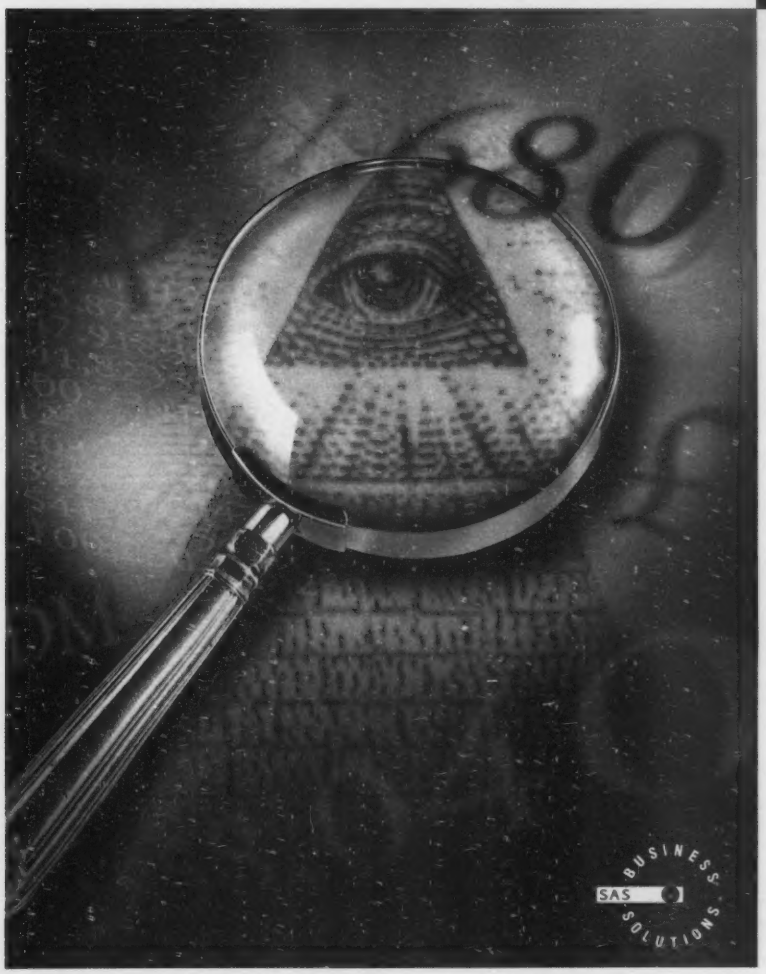

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REVIEW▶ *Authorware 4 Interactive Studio*

Macromedia suite laden with developer goodies

BY HOWARD MILLMAN

Multimedia development using Macromedia, Inc.'s recently released Authorware 4 Interactive Studio (Studio) is like falling into a chocolate candy tank: It's possible to drown happy under the weight of all its goodies.

The suite's two anchor applications are Authorware 4, an interactive authoring system that helps experienced title developers create computer-based training (CBT) applications, and Director, a multimedia management and animation application controlled by Macromedia's Lingo scripting language. The suite also contains a variety of audio and image editing tools and Open Database Connectivity (ODBC) links to back-end databases.

A LOT TO LEARN

Most novice and many experienced title developers will find this package, especially Director, difficult to learn and use; I did. For example, achieving total control over the appearance or behavior of a title's assets often required wading through nested dialog boxes or complex scripting in Lingo. Although Macromedia does a good job of integrating the half-dozen or so stand-alone applications that comprise the suite, each has its own set of menus, functions and features that require time to learn.

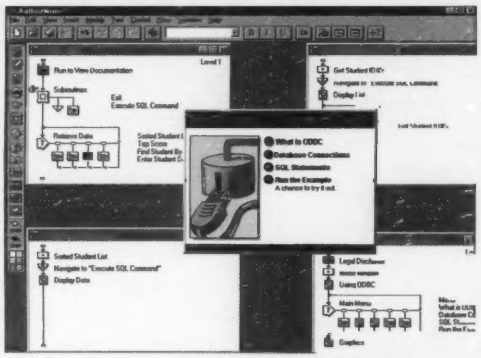
On the positive side, the suite's tools empower title developers with infinite control over every step of a multimedia project. The package can rise to meet any challenge, including building multimedia-rich sales presentations and CBT applications for delivery over an intranet or the Internet or in a self-contained environment such as a kiosk. Macromedia doesn't assess a run-time licensing fee.

Features new to this release include the addition of ActiveX controls to Authorware. For developers, ActiveX libraries simplify adding custom touches to their applications.

Another new feature, QuickStart templates, helped me sail through the initial design of complex projects. A welcome time-saver, because of Interactive Studio's many components, QuickStart offers three types of templates, one each for corporate, educational and consumer applications.

Improved integration between Authorware and Director let me incorporate Director movies into Authorware projects. Improved integration increases the professional touches in the projects through extensive branching and sophisticated animation.

Other enhancements increase the number of file formats Authorware supports, and it has additional links to external media and back-end database tables through ODBC. That increased back-end connectivity promises to accelerate a title's transactional capabilities through real-time access to variables.



As befits a visually oriented design application, Authorware uses flow charts and graphics to represent relationships among objects and events

Backstage 2 and Solis Pathway MV (included in the Windows version only) further simplify the delivery of distributed applications. Backstage 2 provides complete Hypertext Markup Language programming plus site development and management tools, including a proprietary back-end transaction manager. Pathway MV, a CBT management tool, lets authors manage course curriculum and delivery and track enrollment and individual student progress.

I built a CBT title that ran on a Windows NT server system with one Windows 95 client running Netscape Communications Corp.'s Navigator browser. My title's assets, (multimedia elements such as video, images, audio files and even complete World Wide Web pages) resided on the server. To access those assets, I embedded path statements in my title. If you use a Web server, you define a uniform resource locator that points to the asset.

Among the benefits of remote assets are simplified updates, the ability to change an asset without affecting the title's flowline or structure and access to a wider selection of content types. In hierarchical organizations, remote access lets each division create and manage assets specific to their needs and still conform with organizational standards.

SHOCK SHTICK

To stream a completed title over an intranet or the Internet, you need to "shock" it to make it compatible with Microsoft Corp.'s Internet Explorer or Netscape's Navigator. Shocking compresses a title to reduce download times and improve runtime performance. According to Macromedia, titles shocked in Studio run up to 50% faster than those in previous versions. We didn't verify that claim.

Projects designed for (dial-up) Web-based delivery have other performance-based considerations. For example, developers will have the best performance when using smaller images with a maximum of 256 colors. On a 10M bit/sec. LAN, my CBT image-laden title ran acceptably, but when a friend dialed in with a 28.8K bit/sec. modem, she aged visibly waiting for the applet to finish.

ICON-BASED

Authorware uses icons to mark the location and duration of graphics, audio, video and special-effect elements on the project's interactive flowline. Creating the flowline — by dragging and dropping the icons then linking them to an asset — is easy to learn.

Windows/Macintosh interoperability, an attractive feature of the product in light of the Macintosh's significant presence in multimedia, doesn't extend to ActiveX. As a Wintel-specific technology, ActiveX isn't available for the Macintosh.

ROOM FOR MORE

Lingo scripting is a classic mixed blessing. Despite the exquisite degree of control Lingo scripting affords experienced developers, Macromedia should offer alternatives. For example, something akin to a Properties dialog box, popular in object-oriented application development environments, could eliminate some time-consuming scripting when exact control isn't required.

Macromedia ShowMe applets are a step in the right direction. They can help accelerate the scripting process in Director and accelerate development of Authorware sequences. These interactive multimedia tutorials explain how to add video, ActiveX controls and some of the other features in the package.

Authorware also seems unforgiving about mistakes in links. To its credit, it never crashed, but it did hang occasionally when it failed to find the element it expected. A new External Media browser facilitates creating and verifies external links.

In the hands of an experienced developer, Studio can prove an indispensable ally for solving the most advanced challenges of producing eye-catching, ear-riveting multimedia. After experimenting with the product's many features, I think it unlikely that a developer will ever run out of road using the suite. A more likely scenario is that they may have to work a lot harder than they thought to reach their destination. □

Millman operates Data Systems Services Group, an independent networking and problem-solving consultancy. You can reach him at hmillman@mcimail.com.

PRODUCT REVIEW▶

Authorware 4 Interactive Studio
Macromedia, Inc.
San Francisco, Calif.
(800) 326-2128
www.macromedia.com

Pros: Support for ActiveX, strong Web integration, good graphics management, ability to generate Windows and Macintosh cross-platform code

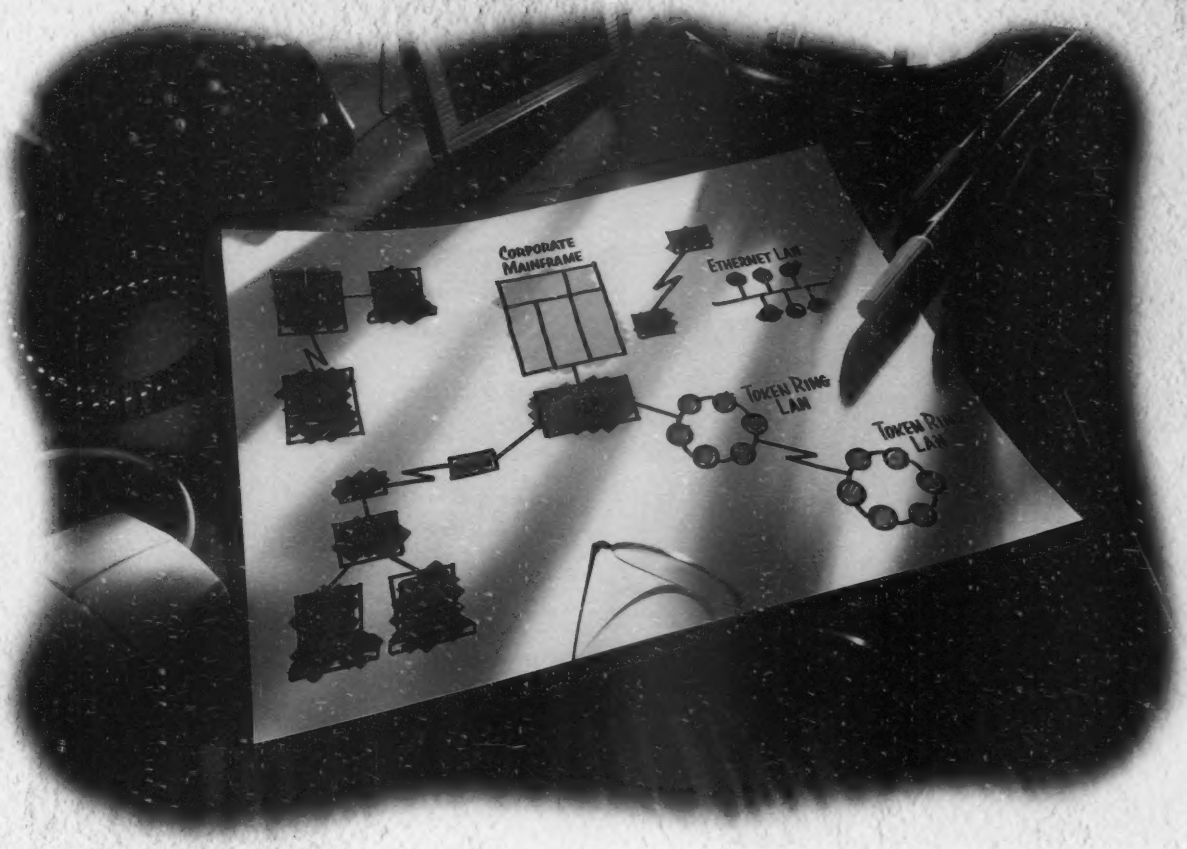
Cons: Complicated and demanding. Skilled multimedia developers should plan on devoting substantial ramp-up time to get the most out of the package's features. Novices should wear a life preserver.

Price: $2,999; $799 upgrade

Platforms: Windows 95, Windows NT, Macintosh and Power Macintosh

OVERALL GRADE B+

Features: A
Ease of use: B



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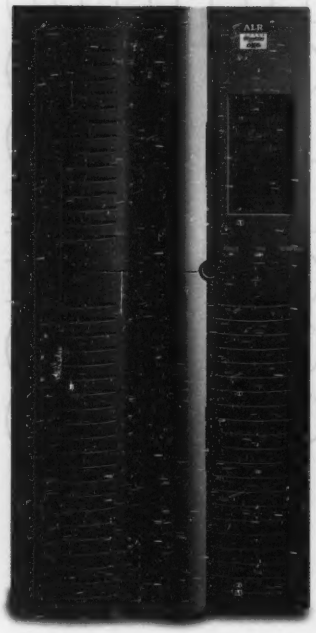

TOP (tpmC) Intel-Architecture Systems*

Rank	Manuf.	System	Throughput (tpmC)	Price/Performance ($per tpmC)	Qty/Processors/MHz
1	ALR®	Revolution™ 6x6 c/s	10,665.53	$48.10	6/Pentium Pro/200MHz
1	Unisys®	Aquanta™ HS/6 c/s	10,665.53	$53.43	6/Pentium Pro/200MHz
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	HP®	NetServer™ LX Pro c/s	9,196.37	$49.62	4/Pentium Pro/200MHz
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	Compaq®	ProLiant™ 6000 6/200 Model 1X c/s	9,028.67	$78.17	4/Pentium Pro/200MHz
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	Digital®	Prioris™ ZX 6200MP	8,145.60	$48.67	4/Pentium Pro/200MHz
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Product comparison chart below is not representative of the machines used in these benchmarks. *Data current on 7/28/97.
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	ALR Revolution 2XLe™	ALR Revolution 6X6™	Compaq Proliant™ 6000
CPU	(1) Pentium II 266/512	(1) Pentium® Pro 200/512	(1) Pentium® Pro 200/512
Maximum No. of Processors	2 (Pentium Pro or Pentium II)	6	4
Memory	64-MB	128-MB	128-MB
Hard Disk Drive Storage	4-Gigabyte (FW ultra SCSI)	9-Gigabyte (FWSCSI)	9-Gigabyte (FWSCSI)
LCD Touchscreen Diagnostics	Not Available	Standard	Not Available
CD-ROM	16X (IDE)	16X (SCSI)	6X (SCSI)
RAID Ready	6 Bays	6 Bays	6 Bays
Hot Swappable Expansion	3 Bays (Optional)	6 Bays	6 Bays
Network Interface	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet
On-board Disk Controller	Fast/Wide Ultra SCSI & IDE	Fast/Wide Ultra SCSI & IDE	Fast/Wide Ultra SCSI & IDE
Server Management	ALR InfoManager™ with Active Ctrl™	ALR InfoManager™ with Active Ctrl™	Compaq Insight Manager™
N+1 Power Supply	Dual 365 Watts with Loadshare	700 Watts (1050 opt.)	750 Watts
Redundant Hot-pluggable	Not Available	Standard	Optional
On-site Service	3 Years On-site Service	3 Years On-site Service	3 Years On-site Service
Factory Warranty	3 Year/36 Months	3 Year/36 Months	3 Year
IDC Estimated Street Price	4,695	9,683	12,713

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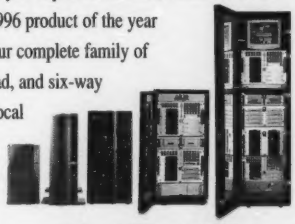

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In Depth

The Domain Name game

BY PAULA JACOBS

Who should control Web addresses? With the current registrar's contract running out and untold money and power at stake, the answer most frequently heard is: 'Me!'

UNPARALLELED FLAME WAR or tempest in a teapot? Everybody's gotten into the domain naming act: businesses, nonprofits, the Clinton administration, the Department of Commerce, the Department of Justice and foreign governments.

The controversy boils down to responsibility for registering and administering domain names, the alphabetical part of Internet addresses used for electronic mail and World Wide Web commerce.

The issue has heated up in recent months because the contract of the incumbent registrar, Network Solutions, Inc. (NSI) in Herndon, Va., expires next March.

As a contractor to the National Science Foundation, NSI holds a monopoly on second-level domain names (such as "whitehouse" in whitehouse.gov).

Funding also will soon run out for the Internet Assigned Numbers Authority, based at the University of Southern California, which handles top-level domains such as .com and .gov.

The Commerce Department recently invited public input on the future of domain name registration and administration. Comments are now posted at the National Telecommunications and Information Administration (NTIA) Web site.

The result of this call for comments has been an international free-for-all. The stakes are high: There are more than 1 million registered domain names. Three thousand are added every day, and more than 90% end in .com. Just five years ago, most of the 7,500 registered domain names ended with .edu or .gov.

"I have never seen a war like this," says Christopher Ambler, a partner at Image Online Design in San Luis Obispo, Calif. "When new Usenet groups were created in the '80s, it was a flame war, but never like this."

Carl Howe, director of network strategies at Forrester Research, Inc. in Cambridge, Mass., sees the issue as one of control. "These are valuable resources, akin only to phone number control," he says. "Some people think that if you can control domain names, there will be a continuing revenue stream and control over one aspect of the Internet. It provides the opportunity to open the toll roads."

RELATED QUESTIONS

The domain name controversy revolves around several related questions. First, who should be responsible for assigning and registering

Domain name game, page 86

The *domain* name *game*

CONTINUED FROM PAGE 85

domain names? The incumbent registrar exclusively? A variety of new registrars? An international governing board?

Second, with the growth of the Internet, should the roster of top-level domains be expanded to include additional types, such as .store and .firm?

Third, what's the role of the government? And which government, considering the Internet's international presence?

Fourth, what are the legal implications — including possible trademark infringements and antitrust violations — if one registrar holds a monopoly?

Finally, will it be necessary to institute a global trademark policy? If so, how do you create an international process to resolve disputes over domain names?

Another problem is that the use of country code suffixes isn't uniform. Because of the Internet's U.S. roots and early dominance, "us" isn't used as a country-code suffix. To address today's global Internet, many believe it should be.

THE PLAYERS

More and more players are entering the domain name frenzy. And on a playing field where nobody's bashful, NSI and the Interim Policy Oversight Committee (IPOC) probably tie for noise level.

NSI has proposed to control .com and allow new registrars to administer new domain names. But NSI has come under fire for a variety of reasons, including a possible Justice Department antitrust violation for being a monopoly.

A plan proposed by the International Ad Hoc Committee (IAHC) to increase the number of top-level domains was ratified in Geneva in May by 80 organizations (but not the U.S. government). The plan calls for an unlimited number of domain-name registries and for the following new top-level domain names: .firm, .store, .web, .info, .nom, .arts and .rec.

The now-defunct IAHC has been replaced by the IPOC, whose self-appointed members were drawn from the IAHC. Formed to administer the original IAHC proposal, the IPOC calls for governing worldwide registration and setting up a nonprofit association in Switzerland. Under that plan, the World Intellectual Property Association would moderate trademark disputes.

IPOC's Perry E. Metzger says, "There are no other reasonable proposals. The other proposals boil down to giving NSI a perpetual government-assigned monopoly and billions of dollars in unearned profits with it."

Howe says the IPOC is a major player because of its international representation. And the Internet Society and some Internet founders have voiced support for the IPOC.

But the IPOC also is highly controversial. Critics fault its policies, which they say are bureaucratic and controlling.

Another objection is that an unlimited number of registries may be confusing and lead to trade-name infringements by companies that register multiple domain names (.com, .store and .firm, for example).

"What is going on in Geneva is incredibly autocratic," says Andy Sernovitz, president of the Association for Interactive Media in Washington. "They answer to nobody, are run by a self-appointed group of technocrats and have proven time and again that they don't care about anyone else's concerns." Sernovitz says the IAHC-cum-IPOC has created an artificial crisis in order to seize control of the Internet.

Also protesting IPOC is Jay Fenello, president of Atlanta-based Iperdome, a new company in the fledgling registration industry. He calls IPOC an attempt at global Internet governance behind closed doors, without legitimate authority and counter to Internet traditions.

Metzger was asked via E-mail to comment on these criticisms but didn't reply.

Iperdome proposes changing the current .com, .org, .net, to .com.us, .org.us and so on to address the country code issue. The company also suggests introducing one personal-domain address (.per), which it says would eliminate the need to change domain names and addresses whenever a user changes Internet service providers.

Yet another plan, proposed by the Enhanced Domain Name System, a group comprising members of the Internet community, calls for free, open-market competition and domain-name registration.

HEART AND SOUL

At the heart of the matter rests the future soul and character of the Internet. Will names be created by one bureaucracy, or will a free-market approach prevail?

Many members of the Internet community, including Internet service providers, firmly oppose governance by intergovernmental organizations such as the United Nations. Such a model directly conflicts with the fundamental structure of the Internet as a network of private networks, they argue. These critics call for management by the private sector.

Barbara Dooley, executive director of the Commercial Internet Exchange Association (CIX) in Herndon, a trade group for Internet service providers, says, "The private sector is quite capable of managing these institutions and creating a self-regulating environment." CIX says government should be called on to stabilize the 'net only if the private sector is unresponsive.

Also calling for a transition to an open, industry-driven environment is Tony Rutowski, Internet vice president at General Magic in Sunnyvale, Calif. He is optimistic that this can occur.

As proof, he cites the recent transition of the Internet backbone from U.S. government management to the open private sector and the creation of a competitive telecommunications environment upon the breakup of AT&T Corp.

DOSE OF REALITY

Despite the current frenzy to resolve the domain name issue, it may be necessary to slow down a bit. For example, Fenello suggests fixing the domain naming problem immediately and waiting until the Internet matures to resolve global Internet governance.

Meanwhile, Dooley anticipates an evolution in the domain name space and predicts an eventual migration to directories.

"[We] don't want to see a huge bureaucratic process and lots of governmental interference," she says. "We have heard the rest of world call for '.us' and think there is space available. . . . Eventually, users will decide whether they want those spaces or not." □

Jacobs consults, writes and lectures on Web-related issues. Her Internet address is pjacobs@world.std.com.

Alphabet soup

PAMELA HOBBS

American Registry for Internet Numbers (ARIN): Proposed nonprofit that would administer and register Internet Protocol numbers to the locations currently managed by NSI. *www.arin.net*

Commercial Internet Exchange Association (CIX): Trade association for Internet service providers. *www.cix.org*

Enhanced Domain Name System (EDNS): Organization that calls for open-market competition and registration of domain names. *www.mcs.net*

Generic Top Level Domain Memorandum of Understanding (GTLD-MOU): International framework for administration and enhancement of the Internet domain name system, established by IAHC. *www.gtld-mou.org*

International Ad Hoc Committee (IAHC): Defunct group formed to increase number of top-level domains. *www.iahc.org*

Interim Policy Oversight Committee (IPOC): Group appointed to administer IAHC proposal. *www.gtld-mou.org*

National Science Foundation (NSF): Originally handled domain name registration. *www.nsf.gov*

Open Internet Congress: Group formed by Association for Interactive Media to protest GTLD-MOU proposal. *www/interactivehq.com/oic*

Internet Assigned Numbers Authority (IANA): Handles top-level domain names. *www.isi.edu*

Network Solutions, Inc. (NSI): Current registrar of top-level domain names under a five-year cooperative agreement with the NSF. The pact expires next March. *www.netsol.com*

InterNIC: Cooperative activity between NSF, NSI and AT&T to provide registration services. *www.internic.net*

U.S. Department of Commerce: Its Notice of Inquiry gave the public until August 1997 to submit input to improve registration process. The notice and comments are posted at the National Telecommunications and Information Administration (NTIA) Web site. *www.ntia.doc.gov*

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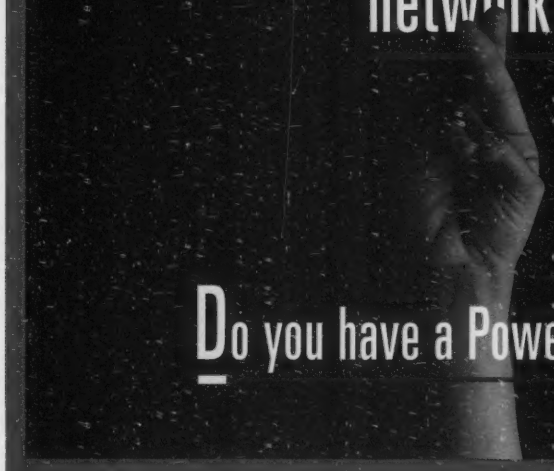

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Year 2000 Recruiting Issues
David Sears, President, D.L. Sears & Associates, Inc.

GENERAL SESSION:

Behavioral Interviewing Techniques
Dr. Paul C. Green, CEO, Behavioral Technology, Inc.

12:30 pm Luncheon Keynote:
Paul Gillin, Editor, Computerworld

TOWN HALL FORUM
Jack Erdlen, Vice President, Romac International/Strategic Outsourcing

CONCURRENT SESSIONS:

Marketing IT Careers: What Works, What Doesn't & Why
Rich Moonblatt & Christina Barron, Bernard Hodes Advertising

Immigration Update
Harry J. Joe, Esquire, Jenkens & Gilchrist

Year 2000 Recruiting Issues
David Sears, President, D.L. Sears & Associates, Inc.

5:30 pm Program Ends

Selected sessions include:

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Paul Gillin, Editor, Computerworld

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Marketing IT Careers: What Works, What Doesn't & Why

Rich Moonblatt & Christina Barron, Bernard Hodes Advertising

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Dr. Paul C. Green, CEO, Behavioral Technology, Inc.

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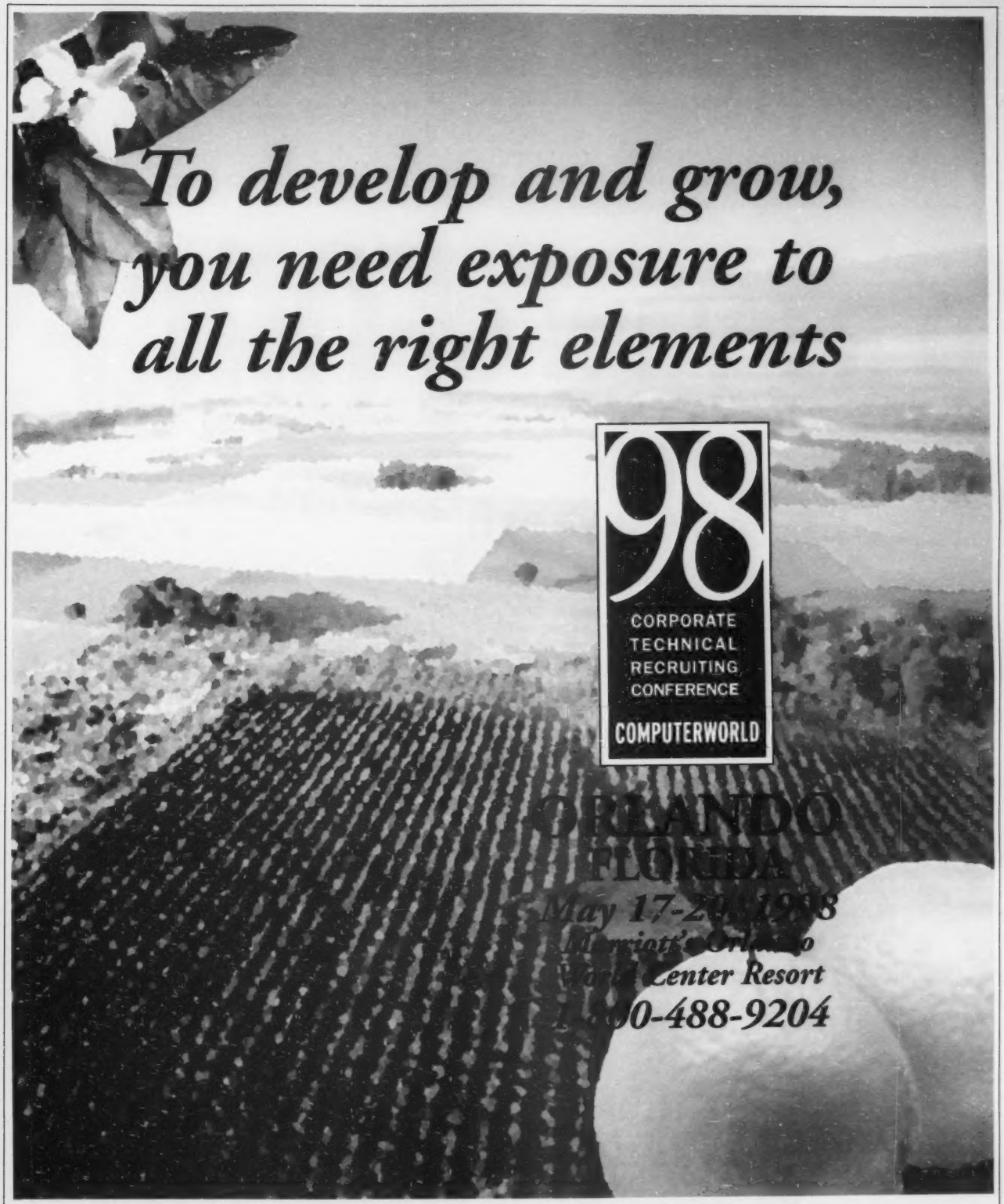
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DRIVING FORCES

PHOTOGRAPHS BY LYNNE SILER

Michelin's Lynn Melvin needs IS professionals who can hold their own with high-level business colleagues, understand their problems and solve them – NOW!

By Rochelle Garner

Yeah, yeah — you've heard it all before. Jobs as we know them will disappear. Straight programming will become synonymous with dead end. The days of working exclusively with other technical professionals are numbered. Instead, the information systems of the immediate future will handle new roles and responsibilities, driven by the twin turbos of new technology and changing business needs.

And you know what? It's true.

Just look around. IS organizations in insurance, telecommunications, finance and manufacturing are striving to fill positions that didn't exist a year ago.

"Up until about five years ago, things were pretty static in the IS industry, and everybody filled the classic job titles," says Lance Boxer, senior vice president and chief information officer at MCI Communications Corp. in Richardson, Texas. "Now, we have all these new positions."

Positions such as security audit engineer, business analyst and knowledge specialist, to name a few. Even a familiar-sounding title such as database analyst encompasses new functions that dovetail with the vast amounts of data companies must manage and analyze to stay competitive.

"Technologies like data warehousing and data marts have created new opportunities to create management information systems," says Robert Spicer II, executive vice president and CIO at Chevy Chase Bank in Chevy Chase, Md. "Now the term MIS is taking on real meaning as companies, particularly in finance, look for ways to make products more profitable.

"And the way to do that is by drilling down through data, analyzing for profitability and risk. This means knowing how to garner information from data, to see patterns and to bring it to management. That's always what I thought MIS was about. But now, it's occurring at a very strategic level, not just at a tactical one," he says.

We're talking opportunity with a capital "O" — a chance to move into truly exciting positions that by their nature finally place IS professionals on an equal footing with their business colleagues. There's just one hitch: Almost without exception, those new positions require a strong business foundation in addition to technical expertise.

Clearly, we're starting to see a theme: To get ahead in the new jobs, IS staffers have to combine business understanding, analytical thinking and the ability to master more than one speciality. That doesn't mean you have to have an MBA, although in some cases, that certainly doesn't hurt. It does mean you need to know the business reasons and objectives that are driving your particular company.

E-COMMERCE:
VISIONARIES ONLY NEED APPLY

"We needed people with the vision to say what the next step will be in how we use the Internet for business purposes and to act first and ask permission later."

When Lynn Melvin, electronic-commerce application manager at Michelin North America in Greenville, S.C., began to put together the company's electronic-commerce team, she had to conquer time on two fronts. "We had to move quickly," Melvin says. And "we filled our positions with people who know the company well enough to meander their way through the political morass that all companies have so they can get things done," she says.

On the technical front, companies diving in to electronic commerce demand that their IS folks have expertise in languages such as Java and Hypertext Markup Language and technologies such as distributed servers and security. But at many companies, electronic commerce is becoming an imperative that spans sales, marketing, purchasing and accounting — a new field that transcends back-office operations. To work there, you need the political smarts to deal with high-level business colleagues, the business acumen to understand why they want what they want and the drive to get it done now.

In Melvin's case, it isn't about only higher-level positions. Everyone on Michelin's electronic-commerce staff needs to start their own engines, whether they're working on distributed servers or updating customer information on the company's intranet, BibNet. That's because BibNet reaches out to nearly 1,700 independent tire dealers, letting them submit orders, read new product specifications and check on inventory, for example. In many cases, Michelin's staff must set up servers and configure software at the client site. "To work within E-commerce, you have to be someone who can make those decisions," Melvin says.

ACCOUNT MANAGERS:

SPEAKING IN MANY TONGUES

"We're looking for people with leadership, communication, influencing skills, ethics, political savvy, negotiation skills, an ability to manage competing demands, team building, decision-making and, of course, business knowledge."

Becky Dawley is creating "account managers" for the roster of new titles at Federated Mutual Insurance in Owatonna, Minn. Her goal is to provide liaisons between the business side and IS, to better translate business needs into IS-speak and let IS serve business more effectively.

As vice president and director of business information services, Dawley says, "We have people now who can meet some of those needs, and we expect they will evolve to meet the rest."

That might sound surprising for a job description that seems to demand almost godlike perfection. And yet, Dawley says she doesn't have to look too far afield to find likely candidates. Many middle managers in IS want the chance to nurture their interpersonal skills. They may not have all the attributes of political savvy, team building and the like, but they have enough to grow into the job.

The job will demand it. "This is a way to improve visibility and respect for IS, and that's why the person in that role is so critical," Dawley says. "They will have to earn that respect from our business colleagues. This is vitally important."

BUSINESS TECHNOLOGISTS:

SEEING THE BIGGER PICTURE

"Business technologists have to be able to analyze, to understand the nuances of business. It's seeing the big picture from the minutia."

LeRoy Pingho has little use for IS go-betweens. As vice president of IS planning and strategy at Fannie Mae — the country's largest source of funds for home mortgages — he considers such jobs to be deadweight.

"There's no real reason to have an extra body between you and business anymore," says Pingho, who is responsible for IS recruiting at the Washington agency. "Translators are worth nothing. That's why last year we started experimenting with the notion of business technologists. It's not a functional title, but our practice is to grow more of them."

It's a practice Fannie Mae takes extremely seriously. It instituted a 16-week training course that includes three weeks of pure business — Fannie Mae-style. In those weeks, IS professionals learn almost every aspect of mortgage trades and funds-handling. Another three-week chunk teaches IS professionals to become expert analysts of financial data.

As a result, the lines between IS and business have blurred to nearly nonexistence. People from the business side are "matrixed" into the technology side and vice versa. And it's paying off. Fannie Mae's IS organization routinely delivers projects with a whopping 400% return on investment, according to Pingho.

Of course, not everyone at Fannie Mae serves as a business technologist. Another new role is that of integrator. "This is someone who can look across platforms, technologies and functions and pull it all together," Pingho says. "They are specialists, but they specialize in more than one thing."

ELECTRONIC CHANNELS:

INTERNATIONAL HARVESTERS

"This is a whole new career opportunity for the database analyst with a strong business background and a strong statistical mind who can help drive decision-making."

All those attributes are in evidence at Chevy Chase Bank, where Spicer helps the bank offer new channels and products to its customers. At play are data warehousing, distributed computing and the Internet. "Because the technologies are so sophisticated and broad, people now have to pick a group of technologies to become expert in," Spicer says.

A prime example is the Internet, which the bank eyes as an entranceway into customers' PCs, television sets and personal digital assistants, each with a unique set of technologies and user issues. Whatever the delivery mechanism, Chevy Chase's goal is the same: to open channels for offering products, services and marketing. The new role for IS: electronic-channel managers.

But a channel counts for little if the products it delivers don't grab the audience. That's where data warehouses come in. Financial institutions store and manage vast amounts of credit-card information that, if analyzed correctly, reveal customers' buying habits and patterns of risk. Who says the analysis of that data doesn't belong within IS?

"This is high-level stuff. So it's not just a matter of knowing how to deal with businesspeople. It's knowing how to deal with people at the top levels of the bank," Spicer says.

The expertise involved includes statistics and a deep understanding of the database holding the information.

KNOWLEDGE EXPERTS:

INFORMATION IS POWER

"Essentially, knowledge specialists have to understand human propensity. They have to know how to harvest information to make it meaningful."

Analytical skills are in huge demand at MCI, where Boxer says these practitioners wear the title, "knowledge specialist." Their job is to sift through yard-high stacks of information — and make sense of it.

One example pertains to the mind-boggling array of problems that find their way to MCI's customer service group. "It used to be fairly easy to answer a customer question," Boxer says. "Now, each problem can have 50 derivatives that branch off from it."

That's why knowledge specialists devise answers to just about every problem they can think of. The next trick is to arrange those answers sequentially, allowing customer representatives to drill down to the eventual problem.

"The skill is how they approach a problem — to look beyond the problem represented to them and to think of the solution in terms of simple, human use," Boxer says.

Intriguingly, people who fill these jobs don't have to have come from a technical background, although that helps.

The real key is their personality.

"One director told me he's looking for candidates from within the business world, because developer skills are taught on the job," says Tom McFadden, a manager at MCI's knowledge services technical training group. "We need someone who's lived in the shoes of the person being catered to. And we want someone with a passion for the job we want them to fill."

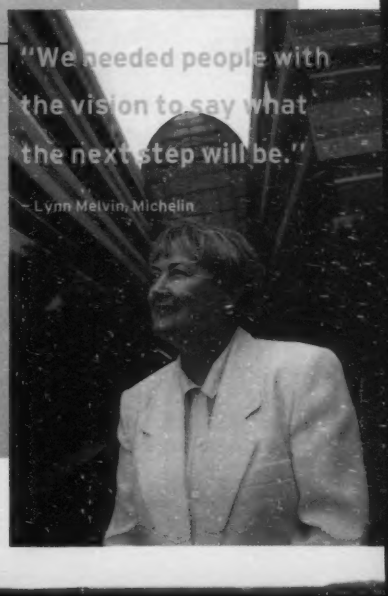
So, OK. Maybe you have heard it all before. Maybe now, you'll believe it.□

Garner is a freelance writer in San Carlos, Calif.

THE NEW JOBS

A sampling of the emerging IS jobs, the skills they require and the IS professionals getting them

JOB POSITION	SKILLS NEEDED	EXPERIENCE REQUIRED
E-commerce staffers	► Ability to work closely with business	► Working in teams ► Proven self-starter
Account managers	► Political savvy	► Traversing political minefields ► Intimate knowledge of the company
Business technologists	► Financial acumen	► Financial training ► Industry analyst
Electronic-channel managers	► Ability to work with executives	► Financial institutions ► Deep understanding of financial markets
Knowledge experts	► Communications	► Customer interactions ► History of looking at old problems in new ways



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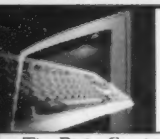

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- 2+ years of relevant system design and development experience in addition to a Bachelor's or Master's degree, preferably in Computer Science/MIS, Engineering, Math, or Business.

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Programmer Analyst to consult with clients, ascertain their business needs; design, develop, test & implement application software in client-server environment; assist users with NFS software installation & troubleshooting; set up & configure multi-vendor modems; install, configure, test, evaluate & report on new products; maintain database of all hardware & software product on network; use C, C++, XVT, Visual C++, Visual Basic, PowerBuilder, Sybase V 10.0 & DB2 in Windows & Unix environment; Reqs. Bach. in Comp. Sci. or Comp. Engg. or Comp. Info. Systems or Comp. Applications or Math or its foreign equiv., 2 yrs exp in job offered or 2 yrs related exp such as Systems Analyst or Programmer. Exp. must include software development, programming, testing, implementing, database administration & user support; using Sybase, Relational Database System, C++, Visual C++, Visual Basic, Powerbuilder, DB2 & XVT in Unix & Windows environment; $40/K, 40 hrs/wk 8a-5p. Must have proof of legal authority to work permanently in U.S. Send 2 copies of both resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Janet Aschenbrenner, Ref. #V-IL-17172-A "Employer Paid Ad"

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CONNECT is a nationally recognized provider of innovative business technology solutions with offices in Minneapolis, Milwaukee, Chicago, Denver, Cleveland and Des Moines/Omaha. We are dedicated to providing the best competitive advantage and investment value to our clients. Our entrepreneurial spirit is Connect's most distinguishing value, providing expanding opportunities and personal growth. JOIN US!

SYSTEMS CONSULTANTS (CD-1)
We are looking for people with experience leading the design and implementation of major System infrastructure efforts in a distributed network environment. Technical prowess combined with demonstrated leadership experience and overall project accountability with large system architectures are key to the success of these individuals. Experience using key infrastructure technologies such as middleware, EDI, database, object infrastructure technologies, messaging, etc. is a clear plus. Project Management experience is viewed as an asset for this role, but is not required.

UNIX CONSULTANTS (CD-2)
We are looking for consultants with experience designing, implementing, and/or supporting an enterprise UNIX environment. Experienced system administrators with specializing expertise in database, network/system management, or network/Internet communications are viewed with priority, although a demonstrable ability to learn these and other specializing skills are also given strong consideration.

NETWORK CONSULTANTS (CD-3)
We are looking for consultants with experience designing, implementing, and/or supporting enterprise client/server network technologies. Experience with routed/switched network equipment, protocols, and analysis/management tools is desirable and hands-on experience is a must.

MESSAGING CONSULTANTS (CD-4)
Professional Messaging Consultant with experience in at least two of the following major mail systems:
• Exchange • Notes Mail
• MS Mail • POP3
• cc:Mail

NETWORK DESIGN/MANAGEMENT CONSULTANTS (CD-5)
We are looking for consultants with experience designing, implementing, and/or supporting enterprise client/server network technologies. Experience with routed/switched network equipment, protocols and analysis/enterprise management tools is desirable and hands on experience a MUST.

NETWORK ENGINEER/SENIOR NETWORK ENGINEER (CD-6)
(Focus: Windows NT Server or Windows NT workstation)
Utilize your expertise to analyze, support and troubleshoot networks. Successful candidates will have experience in some of the following:
• Windows NT Server 3.x/4.x
• Windows NT Workstation 3.x/4.x
• Windows 95

NETWORK MANAGEMENT ENGINEER (CD-7)
(Focus: Network Operating System Related 2nd Level Help Desk)
Utilize your experience as a Network Management Professional with 2 or more of the following:
• HP Overview • Netware
• Intel LANDesk • Compaq Insight
• Bay Optivity • Cisco WorksTivoli
• Remedy • NT Server
• File Server Hardware

EDI ARCHITECT & ENGINEER (CD-8)
We are looking for top notch EDI consultants with experience in EDI mapping (required) and data integration. EDI candidates with the following background will add dimension to our growing arsenal of expertise:
• IDEF and OO analysis/data modeling
• X12 and UN/EDIFACT standards
• Data encryption (RSA, PGP, SSL, SET)
• Data communications (async and Internet)
• C++ or other OO programming languages a plus

STRATEGIC BUSINESS CONSULTANTS (JR-9)
Experience in strategy, planning, systems design and implementation. Expertise in financial services, manufacturing, or package systems selection/implementation is desirable. Need to adopt an overall view; dissect business problems into component parts; perform cost benefit analysis; develop an overall solution and approach.

PROJECT MANAGEMENT (SL-10)
We are seeking qualified individuals who have Project Management experience in an enterprise Client/Server environment. A knowledge of Financial or manufacturing packages is desirable (preferably PeopleSoft and/or Oracle). Strong candidates must have full life cycle experience. Microsoft Project and/or ABTWorkBench desired. Experience in LAN/WAN environments is a plus.

SYSTEMS ANALYST (JR-11)
Experience in systems analysis and design concepts. Ability to create functional and detailed specifications and test plans. Good oral and written communication skills required. Experience with packaged software a plus.

LOTUS NOTES/DOMINO PRACTICE DEVELOPMENT (JR-12)
Connect has an opportunity for a highly motivated individual to become a valued contributor in the growth of a successful Lotus Notes practice. Requirements of the position include the ability to: design and deliver Lotus Notes/Domino solutions, practice development, and business development requiring excellent written and verbal communication skills. Experience in Lotus Notes/Domino application analysis/design/development, system administration, and/or infrastructure architecture is a prerequisite for the position.

DISTRIBUTED APPLICATIONS/SYSTEMS ARCHITECT (JR-13)
Desire to work with other professionals successfully implementing three-tiered architectures? Find out why Rational Software Corporation selected CONNECT as its Solutions Provider in Minnesota. Candidates will possess:
• Experience with DCOM and/or CORBA preferred
• Familiarity with OMGs CORBA Services/DCOM interfaces
• Strong C++ skills and experience with design patterns
• Experience with class libraries essential (MFC, TL, ROGUE WAVE, ATL
• OO Modeling with Rational Rose/Paradigm Plus

C++/VISUAL C++/VISUAL BASIC DEVELOPERS (JR-14)
Our client base offers numerous opportunities for you to use your skills in fascinating, challenging, innovative developments. Our candidates have 1-2 years active experience with C++, Visual C++, and/or Visual Basic and already have the skills listed below or wish to develop them.
• Experience with Active X/COM
• Experience with class libraries
• Experience with design patterns
• Relational/Object Databases

DATABASE & DATA WAREHOUSE CONSULTANTS (JR-15)
Preferred candidates will have experience in:
• Database Administration (preferably Oracle and/or Sybase)
• Data modeling, design, and implementation
• Relational and/or multi-dimensional Database experience
• Familiarity with Decision Support and OLAP applications
• End user query tool implementation and support

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For this high-energy environment, you will need to be a proven business manager with hands-on experience in marketing, sales, and recruiting in a service industry. Successful operation and profitability of a branch office includes the following: prospect to expand client base; manage recruiting and sales staff; ensure the quality of consulting staff; and serve as liaison with Corporate Management. Candidate should have 5+ years' experience in sales and marketing techniques, branch operations, and financial management as well as excellent interpersonal skills. **Job Code: BM**

Technical Recruiter

We are seeking an articulate, driven team player to develop and maintain relationships with software consultants; conduct telephone and in-person interviews to assess consultants' skills and interests; and match consultants with appropriate job opportunities working with them throughout the interview and placement process. Candidate must have 1 year of industry and/or corporate recruiting experience; proficiency with the Internet and creative recruiting techniques; and strong written/verbal communication skills. Communication abilities and professionalism are more important than technical savvy. **Job Code: TR**

Computer People, Inc. provides its employees with a dynamic, team-oriented approach to the IT professional services industry. Additionally, we offer a highly competitive compensation and benefits package befitting our leadership reputation.

Please forward your resume with salary history, indicating Job Code, to our Corporate Headquarters:

Corporate Human Resources
Computer People, Inc.
125 Jeffrey Avenue
Holliston, MA 01746
email: resumes@cpeople.com

Computer People

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PROGRAMMER/ANALYST - Plans, designs, tests and documents computer programs based on knowledge of programming techniques and computer systems. May consult with users of computer programs to determine programming requirements. May be involved in installing completed programs onto production computer systems. Knowledge of COBOL and DB2 and one of the following database management systems: Oracle, MS SQL Server, Sybase or other leading relational database system. Must be willing to travel and relocate as necessary (reimbursement by employer). Requirements: B.S. Degree in Computer Science, Information Systems, Electrical Engineering, EEtech or equivalent to U.S. Bachelor's Degree. 40 hrs per week, $45,000. Must have proof of legal authority to work in the United States. Please submit 2 resumes to D.E.S. Workforce Center, 925 East Fourth Street, Waterloo, Iowa 50704. Please refer to job number 1100633. Employer paid advertisement.

PROGRAMMER/ANALYST - Plans, designs, tests and documents computer programs based on knowledge of programming techniques and computer systems. May consult with users of computer programs to determine programming requirements. May be involved in installing completed programs onto production computer systems. Knowledge of UNIX, and either C or C++ and one of the following database management systems: Oracle, MS SQL Server, Sybase or other leading relational database. Must be willing to travel and relocate as necessary (reimbursement by employer). Requirements: B.S. Degree in Computer Science, Information Systems, Electrical Engineering, EEtech or equivalent to U.S. Bachelor's Degree. 40 hrs per week, $52,000. Must have proof of legal authority to work in the United States. Please submit 2 resumes to D.E.S. Workforce Center, 925 East Fourth Street, Waterloo, Iowa 50704. Please refer to job number 1100639. Employer paid advertisement.

PROGRAMMER/ANALYST - Plans, designs, tests and documents computer programs based on knowledge of programming techniques and computer systems. May consult with users of computer programs to determine programming requirements. May be involved in installing completed programs onto production computer systems. Knowledge of Visual Basic and one of the following database management systems: Oracle, MS SQL Server, Sybase or other leading relational database system. Must be willing to travel and relocate as necessary (reimbursement by employer). Requirements: B.S. Degree in Computer Science, Information Systems, Electrical Engineering, EEtech or equivalent to U.S. Bachelor's Degree. 40 hrs per week, $40,000. Must have proof of legal authority to work in the United States. Please submit 2 resumes to D.E.S Workforce Center, 925 East Fourth Street, Waterloo, Iowa 50704. Please refer to job number 1100636. Employer paid advertisement.

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Programmer/Analyst - Design develop, test & implement software to allow pure Server applications written in Sybase front end tools such as APT, DB-Lib, Transact SQL & SQR to be migrated automatically to Visual Basic, MS-Access, True Grid VBX, Data Widgets VBX & Designer Widgets VBX under MS-Windows 3.1. Design, develop & implement automatic code generators using Visual Basic, C, C++, Oracle, MS-Access, DLL's & third party VBX controls under MS-Windows 3.1/NT using object oriented methodologies & client/server architecture. Perform operating system level & network programming using sockets. Perform detailed system design, development & coding. Responsible for day-to-day project management tasks such as reviews, code walk throughs, testing, quality assurance & bug fixes. Some projects performed at client sites in various geographic locations. Minimum requirements: Bachelor of Science in Computer Science. Must have completed the following coursework: 1) Operating Systems; 2) Software Engineering; & 3) Network & Distributed Processing. Two (2) years experience in the position offered is required. This experience must include the following: (1) Experience in client/server architecture design & implementation using Visual Basic, C & C++; 2) Development of DLL's & use of Third Party VBX Controls, MS-Access, SQL & sockets under MS-Windows 3.1; & 3) Project management experience. Must have completed at least one major client/server project utilizing network programming & sockets under MS-Windows 3.1 environment. 40 hrs per week, 9:00 a.m. to 5:00 p.m. $52,000 per year, overtime pay per hour $25.00. Must have proof of legal authority to work permanently in the U.S. Submit 2 copies of both resume and cover letter to the: Illinois Department of Employment Security, 401 S. State Street - 7 North, Chicago, IL 60605. Attn.: Joan Sykstus, Ref.#V-IL 17273-S. An employer paid ad. No calls.

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CLIENT DATABASE DEVELOPMENT

Ross Ray Communications, Inc. is adding to our information systems team, supporting client based applications in a multi-platform client/server and AS/400 environments. We are currently seeking qualified professionals to fill the following positions:

Business Analysts
- Strong analysis skills required.
- Strong communication skills required.
- Minimum of 10 years general IS experience required.
- Experience in a multi-platform client/server development environment a plus.

Development Managers
- Project and Resource supervision and management skills required.
- Multi-platform client/server development experience with MS/SMS, Oracle, AS/400 and VB a plus.
- Strong communications skills required.
- Minimum of 5 years leading multiple, simultaneous projects required.

Development Leaders
- Strong project supervision skills required.
- Experience in AS/400 environment required, multi-platform client/server a plus.
- Systems analysis and design skills required.
- Strong communications skills required.
- Ability to work in a team environment.

Developer
- Multiple Development Positions Available!
  - Three to five years experience programming in RPG on an AS/400.
  - Two or more years experience with Powerbuilder in a multi-tier environment.
- Strong communications skills required.
- Ability to work in a team environment.

Database Administrator
- Five years experience with Oracle required.
- Unix experience preferred.
- Ability to devise and implement standards in an Oracle environment.
- Applications development background a plus.
- Strong communications skills required.
- Ability to work in a team environment.

We offer a competitive compensation and benefits package as well as a non-smoking environment. If you are interested in any of these opportunities, please send or fax your resume in confidence to:

Ross Ray Communications, Inc.
ATTN: HR-MS-MIS
100 Bloomfield Hills Parkway
Bloomfield Hills, MI 48304
FAX: 248-433-8905

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PROGRAMMER/ANALYST- Plans, designs, tests and documents computer programs based on knowledge of programming techniques and computer systems. May consult with users of computer programs to determine programming requirements. May be involved in installing completed programs onto production computer systems. Knowledge of COBOL AND DB2. Must be willing to travel and relocate as necessary (reimbursement by employer). Requirements: B.S. Degree in Computer Science, Information Systems, Electrical Engineering, EEtech or equivalent to U.S. Bachelor's Degree. 40 hrs per week, $51,000. Must have proof of legal authority to work in the United States. Please submit 2 resumes to D.E.S. Workforce Center, 925 East Fourth Street, Waterloo, Iowa 50704. Please refer to job number 1100634. Employer paid advertisement.

PROGRAMMER/ANALYST - Design, install and maintain a database system. Monitor installed database for performance, tune database, plan disk space requirements, create database backup and restore procedures and implement database security. May be involved in database connectivity issues. May be involved in database access issues through computer programs. Documents database management, monitoring and operating procedures. Knowledge of one of the following or equivalent: DB2, ORACLE, Sybase, SQL Server. Must be willing to travel and relocate as necessary (reimbursement by employer). Requirements: B.S. Degree in Computer Science, Information Systems, Electrical Engineering, EEtech or equivalent to U.S. Bachelor's Degree. 40 hrs per week, $43,500. Must have proof of legal authority to work in the United States. Please submit 2 resumes to D.E.S. Workforce Center, 925 East Fourth Street, Waterloo, Iowa 50704. Please refer to job number 1100635. Employer paid advertisement.

The Secret to His Success? Good Jeans.

Eric Morgan
started at Meijer as a part-time General Merchandise Clerk in our original blue jean shop, The Copper Rivet.

Today, he's the Director of Solution Development for Meijer, Inc., where he merges current technology with the needs of our company.

A Company Unlike Any Other

It is a fact that most of our corporate officers and company managers started as baggers, clerks or in other entry-level positions. Why is this possible at Meijer when it seems virtually impossible anywhere else? Because we, at Meijer, believe our strength lies in the personal strength and ambition of our team members. We believe that a job is more than just a job, it's a career opportunity. That means it's an opportunity for you as well as for us.

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Whether you start as a programmer or senior systems coordinator, you will be joining the company that started the mega-market industry, growing from a small mom-and-pop store in the thirties, to the fourth largest privately held company in the country. Meijer is now a fast growing retailer with beautiful, state of the art stores, and headquarters located in Grand Rapids, Michigan. Our goal is to be the best at what we do, and we are now hiring team members who would like to share in the success of our company.

Eric Morgan, Director of Solution Development

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Meijer, the 10th largest discount retailer in the nation, with over 70,000 employees, is seeking Client Server Information Systems Professionals. These individuals require the ability to work effectively in a team atmosphere with an emphasis on customer and product/service delivery in a network centric computing environment.

We are seeking experienced Information Systems professionals as:

- Client Server Application Developers
- Client Server Network & Communications Analysts
- Client Server Technical Support – Operating Systems, Middleware, Hardware
- Systems Analysts
- Project Leaders/Project Planners
- Systems Methodologists

Qualifications and experience desired include:

- 4 year college degree or equivalent experience
- An understanding and experience with client server methodologies
- Retail business concepts and Point of Sale systems experience
- Client Server architecture, integration and design
- Microsoft Windows environment using one or more of the following: C, C++, Visual Basic, PowerBuilder, Java and ActiveX
- Relational Databases (Sybase experience beneficial)
- DOS, Novell or UNIX in a TCP/IP environment
- Graphical User Interface design
- Development techniques such as Rapid Application Development (RAD) or Joint Application Development (JAD)
- General understanding of ODBC
- Case tools/Automated Process Methodologies

Meijer offers an attractive salary, comprehensive benefit package that includes retirement plans, investment and incentive plans, and a bonus referral program. If you have experience in the positions described, feel you have the qualifications we're looking for and are interested in relocating to the Greater Grand Rapids area in Western Michigan, send or fax your resume detailing qualifications, work history and salary requirements to:

Meijer, Inc.
Employment Department 97/67
Client Server Opportunities
2727 Walker, NW
Grand Rapids, MI 49544-1369
Fax (616) 791-5292

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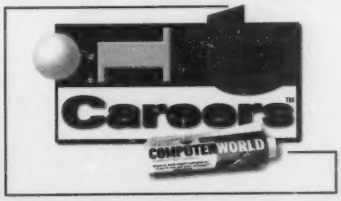

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– DeLinda Daniels
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Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in OS/400, RPG/400, Synon 2E and C. Requirements: Master's Degree in engineering, computer science or related field, two years experience as software engineer or computer programmer (or Bachelor's Degree and five years experience), and knowledge of OS/400, RPG/400, Synon 2E and C. Salary: $52,000/year. Working Conditions: 8:00 a.m. to 5:00 p.m., 40 hours/week. Apply: Pa. Job Center, 120 Merchant Street, Ambridge, PA 15003. Job No. 2014109.

Software engineer with 2 (two) years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using UNIX and LAN and at least one year experience with SAP R/3 and ABAP/4. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in engineering, physics, mathematics or computer science. $140,000/yr. 40 hours/wk., 9:00 - 5:00. Send resumes, listing J-b order number 5013886, to Mr. Terry Kinney, Manager, Office of Employment Security, 1270 N. Water St., P.O. Box 759, Kittanning, PA 16201.

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October 20, 1997

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Will be responsible for large-scale systems development and integration efforts. Engineering Project Management and resource scheduling are critical. Requirements include: B.S. in E.E. or C.S.; experience in C or C++, project estimation, telecommunications with networking or switching, UNIX, and 5-10 years in development management, managing teams of developers. Familiarity with ISO 9000 is desirable.

M CUBED DEVELOPMENT ENGINEER

Experienced Software Developer needed to customize, develop and support sophisticated telecommunications applications for use in telephone networks. Candidates must have 3+ years of relational database programming experience (Oracle preferred). Strong UNIX programming skills, excellent organization skills and superior communication skills are required. Candidates with a knowledge of telephony signaling and UNIX RPC programming techniques are preferred.

APPLICATION CUSTOMIZATION SPECIALIST

Experienced Software Developer needed to customize, develop and support sophisticated telecommunications applications for use in telephone networks. Candidates must have 3+ years of relational database programming experience (Oracle preferred). Strong UNIX programming skills required. Candidates with a knowledge of telephony signaling and UNIX RPC programming techniques are preferred.

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The County of San Bernardino is seeking a highly motivated and experienced administrator to join our executive team to direct the technology infrastructure of the County which embraces Countywide information systems, programming, Year 2000 project and communication services. This highly visible position reports directly to the County Administrative Officer. The successful candidate must possess the innovative skills of a visionary and the ability to develop the architectural standards for all information systems. Strong leadership and communication skills are required as the CIO will have the authority to implement cutting-edge systems which will lead the County into the next century. The competitive compensation package includes a salary of $111,000 and an extensive executive benefits plan which includes car allowance, 401(k) with County match, deferred comp and retirement plans and four (4) weeks annual leave. San Bernardino County Human Resources Department 157 W. 5th Street, San Bernardino, CA 92415-0440 (909)387-5577/8304. www.co.san-bernardino.ca.us
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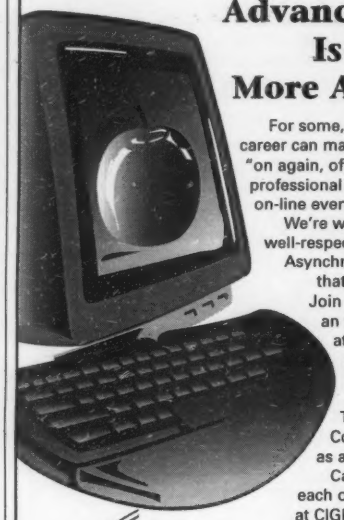

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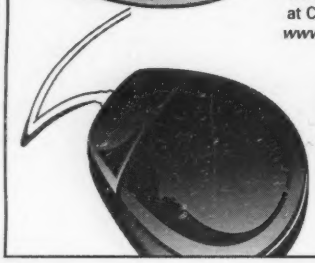

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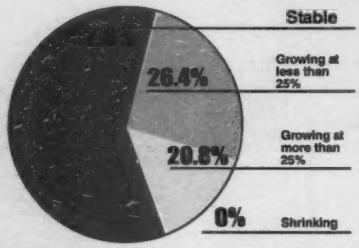
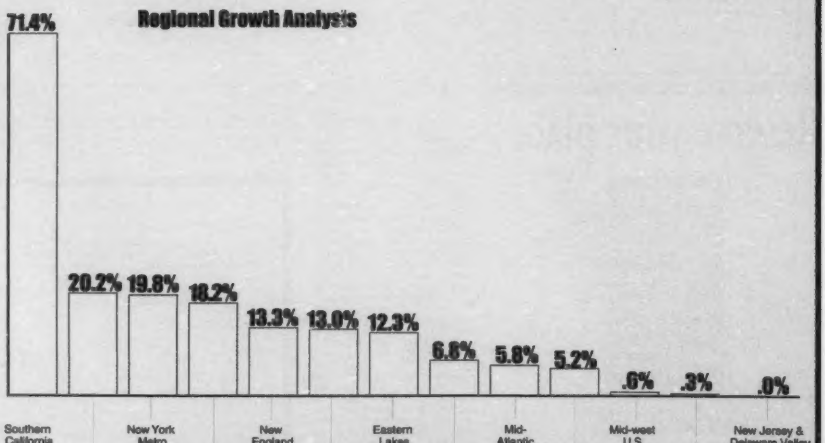


Survey Base: 53 Technology Firms involved in Public Utilities Software

Survey conducted between December '96 and August '97;

CorpTech, a directory publisher in Woburn, Mass., tracks the U.S. 45,000 technology manufacturers. This survey relates to the 31,042 tracked firms with fewer than 1,000 employees.

Regional Growth Analysis



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Connecting Your Recruiting Strategy to What the I.T. Professional Needs
Sue Keever, President, The Keever Group

Immigration Update
David P. Berry, Attorney at Law, Berry, Appleman & Leiden LLP

General Session
Candidate Selection
Dr. William S. Swan, President, Swan Consultants, Inc.

12:30pm **Luncheon Keynote:**
Maryfran Johnson, Executive Editor, Computerworld

Concurrent Sessions:

Connecting Your Recruiting Strategy to What the I.T. Professional Needs
Sue Keever, President, The Keever Group

Immigration Update
David P. Berry, Attorney at Law, Berry, Appleman & Leiden LLP

Town Hall Forum
Fred S. Rodriguez, Corporate Manager of H.R., Hughes Aircraft

5:30pm **Program ends**

Selected sessions include:

Luncheon/Keynote Address

Maryfran Johnson, Executive Editor, Computerworld

Maryfran Johnson, one of the industry's leading watchers of the information Systems profession will give you an up-to-the-minute view in this very special keynote address.

Candidate Selection

Dr. William S. Swan, President, Swan Consultants, Inc.

Now - more than ever - hiring the most productive people is critical. Yet most interviews are no better than chance at predicting how a new employee will behave on the job. In these sessions, you'll learn about the skills necessary to make accurate predictions and conduct an organized selection interview.

Connecting Your Recruiting Strategy to What the IT Professional Needs

Sue Keever, President, The Keever Group

Based on findings of research conducted with five of America's most respected corporations, you'll learn what companies are looking for in today's IT and technical professional and how they are successfully targeting candidates. In addition, findings from focus groups of IT and technical professionals will uncover what candidates are looking for in an employer and how they go through the job search process.

Town Hall Forum

Fred S. Rodriguez, Corporate Manager of Human Resources, Hughes Aircraft

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Cancellations must be received in writing. There is no penalty for cancellations made on or before September 19, 1997. There is a penalty of 50% of your registered rate for any cancellations made between September 20, 1997 and October 3, 1997. Any cancellations received after October 3, 1997 will be billed for the full amount. There are no refunds for "no shows." Substitutions are permissible and should be made in writing prior to October 3, 1997.

For more information, call the conference hotline:
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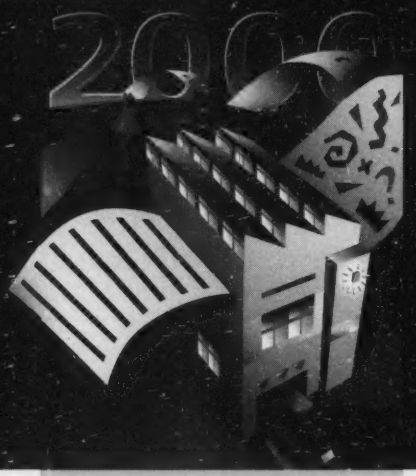

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Seminar Agenda

7:00am - 8:00am	Registration and continental breakfast
8:00am - 9:00am	Peter de Jager, presents *"Year 2000 Computer Date Crisis"*
9:00am - 9:15am	Break
9:15am - 10:00am	Jim Olivero, presents *"SoftFactory/2000: A Unique Approach"*
10:00am - 10:30am	Q & A

Seminar Locations

☐ **Thursday, Sept. 25th**
Hyatt Regency O'Hare
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☐ **Friday, Sept. 26th**
McLean Hilton
McLean, VA

☐ **Monday, Sept. 29th**
Crowne Plaza
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☐ **Tuesday, Sept. 30th**
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☐ **Friday, Oct. 3rd**
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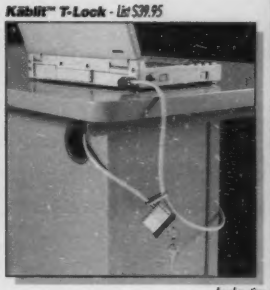

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Automobile, boat/trailer prizes must be picked up at local dealer. All other merchandise prizes will be shipped to winner. Boat/trailer and/or automobile title, tags, license and registration fees are winner's responsibility as are any other incidental expenses not specified in the offer. Trip prizes subject to availability and must be completed within 12 months of date awarded. Actual values of trips depend on location of winners and fares at time of departure. Certain restrictions and blackout dates may apply. If a trip prize is won by a minor, minor must be accompanied by a parent or legal guardian. Winner's traveling companion will be required to sign a release of liability prior to departure. Trip prizes are on a space available basis and do not include personal purchases or incidentals. No substitution of prizes, except sponsor reserves the right to substitute a prize of equal or greater value in the event an advertised prize is unavailable.

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THE FOLLOWING APPLIES TO THE SWEEPSTAKES ABOVE - No purchase, payment or contribution necessary to enter or win. No photocopied or mechanically reproduced entries will be accepted. Not responsible for technical malfunctions, failure of computer, telephone equipment or software, inaccurate transmission of entry information or for lost, late, misdirected, damaged, incomplete, illegible or postage-due mail. All entries become the property of sponsors and none will be returned.

Winner notification will be by mail. A winner may be required to sign and return an Affidavit of Eligibility/Liability/Publicity Release within 14 days of date printed on notification or he/she will be disqualified. Any prize/prize notification returned as undeliverable will result in disqualification. If a major prize is won by a minor, it will be awarded to parent or legal guardian and the Affidavit of Eligibility and Release must be signed by the parent or legal guardian. Except where prohibited by law, winners consent to the use of their names, hometowns, likenesses and photographs for advertising and publicity without additional compensation.

Sweepstakes is open to legal residents of the U. S., Canada and Europe (in those areas where made available) who have received the offer. In the event that the designated recipient of the offer has moved, the offer may not be valid in the state, country or province to which the offer has been forwarded. Void in Puerto Rico and where prohibited by law. All federal, state, provincial and local laws and regulations apply.

All prize values are in U. S. currency. No transfer of prize permitted. A winner is responsible for all taxes on his/her prize.

Canadian residents, in order to win, must first correctly answer a time-limited skill testing question administered by mail. Any litigation regarding the conduct and awarding of a prize in this publicity contest by a resident of the province of Quebec may be submitted to the Regie des alcools, des courses et des jeux.

Sweepstakes may be promoted in different creative presentations by different organizations. Ventura Associates, Inc., 1040 Avenue of the Americas, New York, NY 10018, the independent judging organization has provided all prizes at no charge. Ventura Associates, Inc., reserves the right to withdraw the promotion if it becomes technically corrupted.

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Winner will be determined in a random drawing on or about 5:00 pm (EST) the Monday following the issue date. You need not be present to win. The prize (and its retail value) detailed with the entry form is guaranteed to be awarded & delivered to winner approx. 30 days from drawing date. If notification letter or prize is returned as undeliverable, it will be awarded to an alternate winner at random. No prize substitutions except due to unavailability, in which case a prize of equal value will be awarded. Prize not transferable or redeemable for cash. All taxes on prize are winner's responsibility. Acceptance of prize constitutes permission (except where prohibited) to use winner's name, hometown & likeness for promotional purposes without additional compensation.

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For winners list (available within 4 weeks of the drawing), send a SASE to: Sweepstakes Winners, Computerworld TechnoToys Sweepstakes, 500 Old Connecticut Path, Framingham, MA 01701.

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STOCK TICKER

The Week in Stocks

Gainers

PERCENT

Dataware Technologies Inc.	44.0
Brooktrout Technology	22.6
Creative Technology Ltd.	20.9
SCB Computer Tech. Inc.(H)	20.1
FTP Software Inc.	19.0
Intuit Inc.	18.7
Unisys Corp.(H)	14.5
Standard Microsystems Corp.(H)	13.9

DOLLAR

Intuit Inc.	5.06
Amazon.com(H)	4.81
Creative Technology Ltd.	4.50
NEC America	4.25
Hewlett Packard Co.(H)	3.75
SCB Computer Tech. Inc.(H)	3.63
3 COM Corp.	3.50
IBM	3.38

Losers

PERCENT

Cognos Inc.	-29.4
Informix Corp. (L)	-21.9
Corel Corp.	-19.5
Data General Corp.	-17.1
Cantura Software	-17.0
Pinnacle Micro Inc.	-16.1
Struct. Dynamics Research(H)	-14.3
Applix Inc.	-13.5

DOLLAR

Cognos Inc.	10.00
Lattice Semiconductor(H)	-7.13
Data General Corp.	-5.50
Lycos Inc.	-4.63
Hummingbird Comm. Ltd.	-4.25
Struct. Dynamics Research(H)	-4.25
Stratus Computer Inc.	-4.00
McAfee Associates	-3.75

INDUSTRY ALMANAC

Motorola on call waiting

Investors who are itching to contact their brokers to buy stock from Motorola, Inc. might want to put those calls on hold, analysts say.

Motorola, a maker of processors, cellular telephones and pagers, two weeks ago announced that its exit from the Macintosh clone business will cost the company a onetime charge of $95 million.

Increased expenses in the company's satellite and flat-panel display businesses will cost another $20 million. Factor in slow pager sales in China, and Motorola's estimated third-quarter earnings have fallen from 60 cents per share to between 40 cents and 45 cents per share, analysts say.

After the Macintosh announcement, David Toung, an analyst at Argus Research in New York, downgraded Motorola's stock from a Buy to a Hold.

"We have some concerns about whether the pager market will be profitable," Toung says. "The more modern wireless phones have paging functions, and that will give competition for pagers."

"There's really two pager markets: China and the U.S. The China market is volatile. If it keeps having these ups and downs, it will impact earnings," he says.

When Motorola preannounced its earnings, its stock price fell $7.31 to $68.63.

Toung says Motorola's earnings and revenue will grow 15% or 16% in the next few years. He predicts the Schaumburg, Ill., company will earn $2.31 per share this year and $3.15 next year.

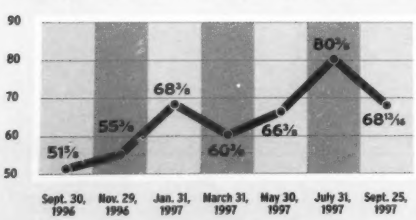
Lawrence Borgman, an analyst at Josephthal Lyon & Ross in New York, says Motorola also has invested heavily in a network of satellites to provide high-speed data and video. "They're incurring a lot of expenses with no offsetting revenues," he says.

Motorola is slated to release its third-quarter results Oct. 6.

—Wylie Wong

MOTORING ALONG

Analysts say Motorola's stock may have peaked this summer



Exch	52-Week High	52-Week Low	Range	Sept. 26 2 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						UP 0.41%
COMS	81.38	24.00	3 COM Corp.	50.75	3.50	7.4
AIT	71.75	52.00	AMERITECH Corp.	65.06	-0.44	-0.7
ASND	80.25	32.06	Ascend Communications	36.56	0.81	2.3
T	46.13	30.75	AT & T (H)	45.44	1.63	3.7
BNYN	6.50	1.19	Banyan Systems Inc.	2.63	0.25	10.5
BAY	39.38	15.38	Bay Networks Inc. (H)	37.38	-0.63	-1.6
BEL	81.69	56.75	Bell Atlantic Corp.	78.94	-1.75	-2.2
BLS	49.00	36.13	Bellsouth Corp. (H)	46.69	0.00	0.0
BRKT	42.25	9.25	Brooktrout Technology	34.25	3.00	22.6
CS	46.50	27.50	Cabletron Systems	32.50	-1.56	-4.6
CGRM	18.50	8.63	Centigram Communications (H)	17.75	0.50	2.9
CSCO	83.25	45.25	Cisco Systems Inc.	73.31	0.19	0.3
CMNT	7.00	3.31	Computer Network Tech.	5.63	0.44	8.4
DIGI	32.75	12.63	DSC Communications	27.75	-0.63	-2.2
FORE	43.63	10.00	FORE Systems Inc.	19.06	-1.31	-6.4
GDC	12.38	5.38	General Datacomm Inds. (L)	6.06	0.06	1.0
GSX	53.00	36.13	General Signal Networks	42.75	0.19	0.4
GTE	49.38	38.00	GTE Corp.	46.13	0.50	1.1
LU	90.75	39.00	Lucent Tech.	80.63	-2.13	-2.6
MADGF	16.13	4.50	Madge Networks NV	7.38	-0.69	-8.5
MCIC	43.38	23.88	MCI Communications Corp.	29.69	0.88	3.0
NETM	9.88	2.50	NetManage Inc.	4.00	-0.31	-7.2
NTRX	8.13	1.44	Netrix Corp.	2.06	0.03	1.5
NCDI	16.25	5.25	Network Computing Devices	10.50	-0.88	-7.7
NWK	22.38	11.25	Network Equipment Tech.	17.69	-0.63	-3.4
NETG	30.25	11.13	Network General	18.56	0.31	1.7
NN	55.75	26.50	Newbridge Networks Corp. (H)	61.06	1.31	2.2
NT	107.75	56.63	Northern Telecom Ltd. (H)	103.31	-0.44	-0.4
NOVL	13.00	6.28	Novell Inc.	8.88	-0.25	-2.7
OCTL	31.75	13.50	Octel Communications Corp.	31.00	0.88	2.9
ODSI	19.25	9.75	Optical Data Systems Inc.	13.13	-0.13	-0.9
PCTL	37.88	8.25	Picturetel Corp.	10.81	-0.88	-7.5
PTON	4.25	1.31	Proteon Inc.	1.75	0.03	1.8
RACO	6.38	1.50	Racotek Inc.	2.00	0.25	11.1
RETX	9.25	3.38	Retix	6.44	0.06	1.0
SBC	62.25	47.00	SBC Communications	58.94	-0.94	-1.6
SFA	24.94	13.25	Scientific Atlanta Inc.	22.69	0.88	4.0
SHVA	63.50	8.25	Shiva Corp.	13.69	0.06	0.5
FON	52.75	37.50	Sprint Corp.	47.50	-0.06	-0.1
SMSC	16.75	8.25	Standard Microsystems Corp. (H)	14.88	1.81	13.9
USW	39.44	29.25	U S West Inc.	38.13	0.88	0.0
XIRC	31.13	7.50	Xircom	13.19	0.06	0.5
XYLN	59.38	12.38	Xylan Corp.	21.50	-1.00	-4.4
PCs and Workstations						DOWN 0.23%
AAPL	29.56	12.75	Apple Computer Inc.	21.28	-0.72	-3.3
CPQ	79.56	20.50	Compaq Computer Corp. (H)	74.06	-0.94	-1.3
DELL	101.25	18.75	Dell Computer Corp. (H)	98.44	1.94	2.0
GTW	46.25	19.38	Gateway 2000 Inc.	33.56	1.19	3.7
HWP	72.94	42.50	Hewlett Packard Co. (H)	71.44	3.75	5.5
MUEI	25.38	12.63	Micron International Inc.	18.25	-1.25	-6.4
NIPNY	74.00	53.50	NEC America	61.13	4.25	7.5
SGI	30.31	12.63	Silicon Graphics	26.63	-1.94	-6.8
SUNW	53.31	25.50	Sun Microsystems Inc.	48.69	-1.81	-3.6
Large Systems						UP 1.36%
DGN	37.94	12.88	Data General Corp.	26.69	-5.50	-17.1
DEC	47.81	25.00	Digital Equipment Corp.	43.31	2.88	7.1
IBM	109.44	61.63	IBM	102.63	3.38	3.4
MDCD	8.75	2.88	Meridian Data Inc.	5.25	-0.25	-4.5
PRCM	20.13	9.00	ProCom Technology, Inc.	13.63	1.38	11.2
SQNT	31.25	12.25	Sequent Computer Sys.	24.75	1.63	7.0
TEXM	3.88	2.06	Sequoia Systems Inc.	3.50	0.00	0.0
SBA	60.75	19.00	Stratus Computer Inc.	48.50	-4.00	-7.6
UIS	12.81	5.75	Unisys Corp. (H)	12.81	1.63	14.5
Software						DOWN 0.76%
ADBE	53.13	32.50	Adobe Systems Inc. (H)	49.84	0.84	1.7
AMSWA	15.00	4.63	American Software Inc. (H)	14.38	0.38	2.7
APLX	40.00	3.13	Applix Inc.	8.44	-1.31	-13.5
ARSW	51.00	17.00	Arbor Software	48.19	-2.06	-4.1
ADSK	47.00	21.00	Autodesk Inc.	44.25	0.88	2.0
BGSS	32.50	21.00	BGS Systems Inc.	28.00	0.00	0.0
BMCS	69.50	39.25	BMC Software Inc.	64.94	-1.06	-1.6
BOOL	35.25	16.38	Boole and Babbage	27.88	-0.13	-0.4
BORL	10.38	4.75	Borland Int'l. Inc. (H)	9.81	0.13	1.3
BOBJY	20.50	6.63	Business Objects	10.13	0.94	10.2
CAYN	6.25	2.00	Cayenne Software Inc.	2.81	-0.19	-6.3
CNTR	5.88	1.13	Centura Software	2.44	-0.50	-17.0
CHKPF	36.25	15.63	Checkpoint Software Technologies	29.75	0.75	2.6
COGNF	39.50	21.50	Cognos Inc.	24.00	-10.00	-29.4
CA	74.75	37.25	Computer Associates (H)	70.81	2.50	3.7
CVN	10.38	1.94	Computervision Corp.	2.06	-0.13	-5.7
CPWR	65.38	20.75	Compuware Corp.	60.00	-0.50	-0.8
CSRE	18.88	8.00	Consilium Inc.	8.06	-0.31	-3.7
COSFF	9.69	4.00	Corel Corp.	4.00	-0.97	-19.5
DWTI	6.63	2.25	Dataware Technologies Inc.	4.50	1.38	44.0
FILE	36.50	9.50	Filenet Corp.	15.75	-0.69	-4.2
FRTE	47.00	7.25	Forte Software	13.13	-1.13	-7.9
FTPS	8.63	3.50	FTP Software Inc.	4.50	0.72	19.0
HUMCF	44.25	22.00	Hummingbird Comm. Ltd.	38.50	-4.25	-9.9
HYSW	32.50	13.00	Hyperion Software Corp.	29.94	-0.25	-0.8
IRC	18.88	11.13	Information Resources	17.63	0.03	0.2
IFMXE	31.13	5.88	Informix Corp. (L)	7.38	-2.06	-21.9
INGR	12.63	6.25	Intergraph Corp.	11.44	0.00	0.0
LEAF	3.75	0.81	Interleaf Inc.	2.88	-0.16	-5.2
ISLI	18.50	6.25	Intersolv Inc.	15.69	-1.50	-8.7
INTU	40.25	20.88	Intuit Inc.	32.13	5.06	18.7
TLC	25.75	5.50	Learning Co. (The)	14.00	-0.31	-2.2
LGWX	9.38	4.13	Logic Works	9.38	0.50	5.6
MAPS	13.00	7.88	Mapinfo Corp.	9.63	-0.50	-4.9
MATH	5.75	2.19	MathSoft	3.00	0.25	9.1
MCAF	78.50	36.50	McAfee Associates	50.13	-3.75	-7.0
MENT	13.13	6.50	Mentor Graphics	12.00	-0.50	-4.0
MFGY	36.50	12.25	Micro Focus (H)	34.88	-0.63	-1.8
MGXI	8.25	4.00	Microgate Inc.	6.50	-0.25	-3.7
MSFT	150.75	65.50	Microsoft Corp.	132.44	-0.50	-0.4
ORCL	42.13	22.50	Oracle Corp.	37.69	0.19	0.5
PMTC	64.25	37.50	Parametric Technology	45.13	1.31	3.0
PARQ	4.00	0.88	ParcPlace Systems Inc.	1.09	-0.13	-10.3
PSFT	66.38	30.63	Peoplesoft	56.75	-2.88	-4.8
PTEC	19.75	11.00	Phoenix Technologies	14.81	-0.31	-2.1
PSQL	13.75	6.50	Platinum Software	11.56	0.56	5.1
PLAT	25.00	10.25	Platinum Technology	22.00	-1.06	-4.6
PRGS	23.00	12.63	Progress Software Corp.	21.88	1.75	8.7
RNBO	24.88	13.75	Rainbow Technologies Inc. (H)	23.50	1.63	7.4
REDB	28.00	5.00	Red Brick Systems Inc.	8.75	-0.38	-4.1
ROSS	9.75	1.75	Ross Systems, Inc.	3.69	0.13	3.5
SAPE	61.00	30.00	Sapient Corp.	50.50	0.25	0.5
SCOC	8.63	3.13	SCO Inc.	6.38	-0.13	-1.9
SDTI	44.38	21.00	Security Dynamics Tech.	36.13	-0.13	-0.3
SOTA	15.75	8.88	State of the Art (H)	15.75	0.38	2.4
SSW	78.88	27.25	Sterling Software Inc.	34.69	-1.19	-3.3
SDRC	30.00	12.13	Struct. Dynamics Research (H)	25.38	-4.25	-14.3
SYBS	21.63	12.13	Sybase Inc. (H)	18.25	-1.81	-9.0
SYMC	25.75	9.88	Symantec Corp.	21.31	-1.56	-6.8
SNPS	50.00	21.75	Synopsys	41.00	0.94	2.3
SSAX	17.63	3.88	System Software Assoc.	15.50	0.00	0.0
SYSF	35.75	7.38	Systemsoft Corp.	10.13	0.88	9.5
TRUV	5.63	1.50	Truevision Corp.	3.50	0.31	9.8
VIEW	23.38	8.38	Viewlogic Systems (H)	22.50	1.19	5.6
VMRK	10.88	5.50	VMark Software Inc.	10.00	0.13	1.3
WALK	18.25	10.50	Walker Interactive Systems (H)	17.63	0.06	0.4
WALL	29.13	12.25	Wall Data Inc.	20.63	2.50	13.8
WANG	29.00	16.00	Wang Laboratories Inc.	20.00	0.03	0.2
Internet						DOWN 0.44%
AMZN	57.75	15.75	Amazon.com (H)	49.75	4.81	10.7
AOL	80.50	22.38	America On-Line	71.81	-3.50	-4.6
ATHM	25.50	16.63	At Home Corp.	21.50	-1.00	-4.4
CSRV	15.88	8.63	Compuserve Corp.	14.38	-0.06	-0.4
EDFY	21.00	8.88	Edify Corp.	14.06	-0.56	-3.8
XCIT	35.00	5.50	Excite, Inc. (H)	29.75	0.56	1.9
SEEK	11.50	4.38	Infoseek Corp.	9.25	0.94	11.3
LCOS	42.00	9.50	Lycos Inc.	33.13	-4.63	-12.3
NETC	19.13	7.88	Netcom On-Line	12.13	-0.31	-2.5
NSCP	65.00	23.50	Netscape Comm. Corp.	39.25	-1.75	-4.3
OMKT	25.50	6.50	Open Market Inc.	15.81	1.69	11.9
PSIX	14.50	5.50	PSINet	8.06	-0.38	-4.4
QDEK	8.25	2.00	Quarterdeck Corp.	3.00	0.25	9.1
RAPT	25.75	8.88	Raptor Systems	16.63	-0.50	-2.9
SCUR	14.50	4.75	Secure Computing Corp.	6.63	-0.25	-3.6
SPYG	19.50	6.00	Spyglass Inc.	9.25	-0.75	-7.5
YHOO	58.00	11.25	Yahoo! Inc.	50.63	-0.75	-1.5
Semiconductors						DOWN 1.44%
AMD	48.50	14.13	Advanced Micro Devices	32.25	-0.19	-0.6
ADI	36.25	18.75	Analog Devices Inc.	33.50	0.13	0.4
CHPS	26.50	7.88	Chips and Technologies	16.13	-0.75	-4.4
CRUS	24.25	8.00	Cirrus Logic	14.38	-1.56	-9.8
CY	18.94	10.50	Cypress Semiconductor Corp.	15.63	-0.13	-0.8
CYRX	34.50	12.88	Cyrix	33.28	0.28	0.9
INTC	102.00	47.13	Intel Corp.	93.50	-1.94	-2.0
LSCC	74.50	27.50	Lattice Semiconductor (H)	65.13	-7.13	-9.9
LSI	46.88	21.38	LSI Logic Corp.	32.94	3.06	10.3
MCRL	42.19	9.13	Micrel Semiconductor Inc. (H)	37.63	-1.13	-2.9
MU	60.06	24.88	Micron Technology	34.44	-3.50	-9.2
MOT	90.50	44.13	Motorola Inc.	68.13	1.38	2.1
NSM	42.19	17.63	National Semiconductor	40.69	0.31	0.8
TXN	142.00	47.50	Texas Instruments (H)	134.38	-1.19	-0.9
VLSI	38.69	14.88	VLSI Technology (H)	35.50	1.44	4.2
XLNX	58.50	30.88	Xilinx	50.00	-3.38	-6.3
ZLG	29.50	17.00	Zilog Inc.	24.56	-0.13	-0.5
Peripherals and Subsystems						UP 0.28%
ADPT	51.38	27.88	Adaptec Inc.	47.88	-0.88	-1.8
APCC	31.50	14.13	American Power Conversion	27.13	0.50	1.9
CREAF	26.00	5.38	Creative Technology Ltd.	26.00	4.50	20.9
RACE	24.50	6.50	Data Race Inc.	8.25	-0.50	-5.7
DTM	12.50	6.75	Dataram Corp.	9.63	0.75	8.5
EMC	62.75	21.63	EMC Corp. (H)	56.63	-3.00	-5.0
EMLX	21.25	14.13	Emulex Corp.	17.13	-1.13	-6.2
ESCC	33.25	20.00	Evans and Sutherland (H)	32.63	1.63	5.2
EXBT	17.50	9.50	Exabyte	11.16	-0.78	-6.5
ISLF	2.63	1.06	Intelligent Info. Systems	1.16	0.03	2.8
IOMI	29.13	14.13	Iomega Corp.	25.94	-1.94	-7.0
IPLS	2.81	0.94	IPL Systems Inc. (H)	2.50	-0.06	-2.4
KMAG	36.75	15.31	Komag Inc.	21.13	-0.25	-1.2
MTSI	34.88	16.50	Micro Touch Systems Inc.	26.13	-2.13	-7.5
MTIC	14.63	1.75	MTI Technology Corp. (H)	12.13	1.13	10.2
PNCL	8.75	0.59	Pinnacle Micro Inc.	0.61	-0.16	-16.1
AQM	6.38	2.38	QMS Inc.	2.94	0.06	2.2
QNTM	43.25	8.63	Quantum Corp. (H)	40.31	1.56	4.0
RDUS	2.06	0.19	Radius Inc.	0.72	0.03	4.5
SEG	56.25	25.88	Seagate Technology	37.31	0.38	1.0
SOS	19.63	9.75	Storage Computer Corp.	11.63	0.13	1.1
STK	54.38	33.25	Storage Technology	49.44	0.88	1.8
TEK	69.63	38.75	Tektronix Inc. (H)	67.13	0.13	0.2
WDC	54.75	19.25	Western Digital Corp.	48.44	0.31	0.6
XRX	84.50	64.63	Xerox Corp.	80.88	3.13	4.0
Services						UP 0.70%
AMSY	37.13	15.75	American Mgmt. Systems	19.88	-0.63	-3.0
ANLY	43.75	21.25	Analysts Int'l. (H)	42.00	0.25	0.6
AUDY	50.44	26.56	Auto Data Processing	49.06	1.06	2.2
BDMI	30.13	19.75	BDM International Inc.	24.94	0.94	3.9
CATP	38.94	21.25	Cambridge Tech. Partners	35.88	-0.88	-2.4
CEN	53.13	29.50	Ceridian Corp.	35.94	-1.31	-3.5
CDO	31.88	18.38	Comdisco Inc. (H)	31.88	2.31	7.8
CPU	35.50	13.25	CompUSA Inc. (H)	35.19	2.25	6.8
CHRZ	45.63	16.25	Computer Horizons	33.00	-3.38	-9.3
CSC	86.50	57.88	Computer Sciences	71.00	-2.38	-3.2
TSK	49.38	14.38	Computer Task Group	42.94	-2.81	-6.1
EGGS	10.13	3.63	Egghead Discount Software (H)	8.88	0.63	6.6
EDS	63.38	31.75	Electronic Data Systems Corp.	36.00	0.50	1.4
ICO	40.63	19.75	Inacom Corp. (H)	37.63	1.88	5.2
INEL	10.75	2.25	Intelligent Electronics	4.81	0.19	4.1
KEA	53.00	11.25	Keane Inc.	32.00	-0.50	-1.5
MICA	29.75	12.31	Micronage Inc. (H)	27.38	0.63	2.3
PAYX	42.50	25.63	Paychex	34.00	-2.13	-5.9
PMS	64.94	33.13	Policy Management Sys. (H)	62.13	-2.69	-4.1
REY	30.63	13.75	Reynolds and Reynolds	20.88	0.56	2.8
SCBI	21.63	10.75	SCB Computer Tech. Inc. (H)	21.63	3.63	20.1
SEIC	33.50	18.75	SEI Corp.	33.50	1.25	3.9
SMS	61.75	36.75	Shared Medical Systems	53.13	0.00	0.0
SSPE	33.50	10.00	Software Spectrum Inc.	18.50	0.25	1.4
SDS	27.13	18.50	Sungard Data Systems	25.69	-0.34	-1.3
VST	29.75	6.50	VanStar Corp.	14.13	0.38	2.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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COMMON USER GROUP

Users to IBM: Promote AS/400

By Tim Ouellette
SAN ANTONIO

TWO OUT OF three ain't bad.

AS/400 users at the COMMON conference here say IBM has succeeded in upgrading the hardware and operating system of the midrange platform with the latest AS/400E models.

But users are concerned about the missing third piece of the puzzle: aggressive promotion of the AS/400 platform to attract new customers.

Loyal AS/400 users said the lack of new users coming to the system, compared with Unix and Windows NT, could marginalize the AS/400 and call into question their decision to build their businesses on the platform. Several traditional AS/400 third-party developers and systems integrators have already strayed toward other high-growth platforms.

"IBM is trying to improve the image of the AS/400, but they have a ways to go," said Gordon Searles, a senior systems programmer at Recreational Equipment, Inc. in Seattle. "If they fail [to attract new customers], then the AS/400's role in computing will always be limited."

New features in the AS/400E [CW, Aug. 25] include high-end models, native support for Java and Windows NT, and integrated web servers and firewalls.

But users said IBM has to tell people beyond the user base that these new systems and features exist.

"We understand that this is a big problem and needs to be addressed," said Malcolm Haines, IBM's program manager for AS/400 communications planning. IBM officials said they are spending more on AS/400 marketing than ever before — some sources said the budget is more than $100 million — but observers said the efforts have fallen far short of expectations.

Rick Flagler, an information technology manager at MPB Corp. in Keene, N.H., said, "They can't just put a giant red 'E' on a page and then have a little AS/400 in fine print somewhere in the corner," referring to IBM's current advertising campaign.

Users want IBM to be more aggressive when comparing the AS/400's ease of setup and use with Unix and Windows NT systems, spice up its advertising image and make it easy for college and high-school students to work on the system.

But being aggressive against other platforms IBM sells will be hard for Big Blue.

"It is difficult for IBM to get aggressive against Unix or Windows NT when they also sell the RS/6000 and are positioning themselves as a major NT vendor," said Tom Bittman, an analyst at Gartner Group, Inc. in Stamford, Conn. □

IT recruiting options varied

CONTINUED FROM PAGE 1

two years, she has billed more than $1 million in finder's fees and personally amassed more than 100,000 stock options in the 40-plus start-up firms at which she has placed top talent.

"I'm not raking it in and going on wonderful vacations and driving around in an $80,000 car, but I'm heading there," Nelson said. In the meantime, "I'm certainly not hurting."

BUSINESS IS GOOD

With unemployment at a 23-year low and demand for high-tech talent skyrocketing, Silicon Valley recruiters at all levels are doing a very brisk business.

Between June 1996 and mid-1997, executive search firm Korn/Ferry International in San Jose, Calif., reported a 20% jump in demand for executives at advanced-technology firms.

But not all recruiters operate alike. Whereas Nelson prefers a portion of her payment in stock options, Jesse Hahn of HTC Research in Contra Costa County, Calif., operates more of a cash-on-the-barrelhead operation.

For $40 apiece, HTC furnishes the names of qualified IS job candidates, primarily to contract recruiters. It gets names from online chat rooms and user group discussions, newspaper and magazine articles, telephone calls and its own proprietary database.

HTC sells more detailed profiles, including a summary of candidates' experience and skill sets, for $100 each. And $500 buys a candidate's full resume.

To assemble HTC's lists of candidates, "we use every trick in the book and all of the resources in today's technology," said Hahn, who started his business five years ago after becoming disenchanted with more traditional recruiting work.

"The problem with headhunting is you can do your job perfectly, and then something will happen in the interview to mess it up," Hahn said. "The guy's tie isn't on straight or the resume isn't neat enough. I'd find people, but I wasn't responsible for the hiring process." By selling names, Hahn earns his fees up front, regardless of whether the candidates he provides are hired.

NEW APPROACH

Hahn now concentrates solely on locating qualified candidates for predefined positions, then turning them over to contract recruiters, such as Jeff Shiverdaker, a principal at Global Executive Search in San Jose.

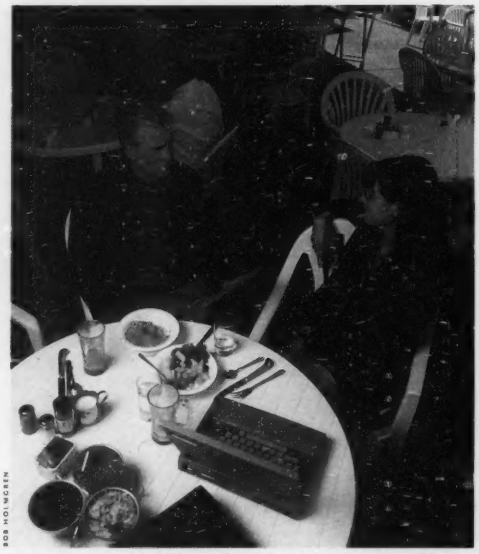
"I tell Jesse to find me the guys, and within a day or two, I have a slate of candidates I can begin calling to recruit. Jesse understands the staffing game," Shiverdaker said.

A former actor, Shiverdaker said he earns between $4,000 and $6,000 per week recruiting software developers and other technical professionals for big companies, including Intel Corp., Silicon Graphics, Inc. and Adobe Systems, Inc.

"I'm a very competitive person, and for me, recruiting is like a game of Stratego. I want to go a long way without hitting a bomb and get to the other person's flag before they get to mine," Shiverdaker said.

Nelson, by contrast, approaches recruiting as "a far slower and more formal process," especially in cases of high-tech start-ups where stock options are involved.

You have the incentive "to own what you build and partner for success. So I need to have an intimate knowledge of a company's entire sociology," Nelson says. "Before I even write the positions, I'm studying the financials and business plan and talking to the board and employees to know the market and the issues." □



NEERDOSH ROY

TalentWave's Emily Nelson (right) has billed more than $1 million in finder's fees for placing top talent

Payment plans

Cash-strapped companies trying to hire high-priced technical talent may find some relief under an emerging headhunting-for-equity model.

Rather than ante up traditional recruiting fees that can run as much as 30% of a candidate's first year's salary, companies pay part of the recruiting fees in stock options.

That's how Lynden Corp., a 3-year-old videoconferencing software company in Idaho Falls, Idaho, plans to pay off a good part of the cost of snagging a top-notch chief information officer.

"When you're talking about bringing in guys from extremely large companies [who are] making extremely large salaries, you're also talking about extremely large [recruiting] fees," said Jack Finegold, president of Lynden and a client of TalentWave.

TalentWave "has brought in a higher caliber of candidates than we've been able to bring in ourselves, and stock options is how we're able to do it," Finegold said.

Tom Henry, president and CEO of Quote.Com, another TalentWave client, said, "If you're trying to hire someone who's going to make a long-term difference, you want [a recruiter] with skin in the game." — Julia King

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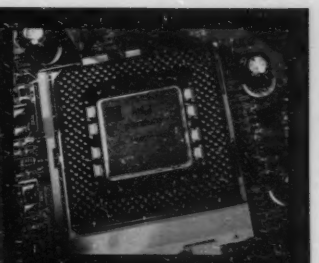

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COMMENTARY

The Feds' ludicrous encryption plan

Dan Gillmor

Any sensible enterprise strives to maintain the security of one of its most vital assets: information. And as more information moves onto private and public networks, encryption is an essential component of any security program.

But if some government officials get their way, your information may well be in more jeopardy than ever in coming years.

Even the most security-paranoid government officials recognize the necessity for encryption to protect data security. But the government is absolutely terrified of encryption's potential for use by criminals. And because of that, powerful people are willing to kill off what's left of the Fourth Amendment and poke a giant hole in the First Amendment's guarantee of free speech.

The U.S. technology industry already has been harmed by antiquated government policies that classify encryption as a weapon. Government rules forbid, for the most part, the overseas sales of products that contain strong encryption.

Congress was considering whether to loosen the export restrictions, which cause U.S. companies to lose sales to overseas competitors. But after a series of closed-door briefings with law-enforcement and military officials, the momentum shifted toward a more alarming possibility: making it illegal for U.S. citizens to use strong encryption that the government can't break.

Law enforcement wants the ability to read or otherwise view — in plain text or its equivalent — anything that anyone sends to anyone else at any time. It could achieve that in one of two ways (or both): Force all vendors of products that include encryption to also include a "back door" that law enforcement could use whenever it suspected wrongdoing, or force vendors to create a key-escrow system in which keys would be stored by a third party that would have to give up a user's key upon request.

The practical problems with these systems are clear to experts who've said such systems would make our nation considerably less secure. Among the difficulties with a key-escrow system, according to a recent report by some top cryptographers and computer scientists (*www.crypto.com/key_study/report.shtml*), are complexity, expense and the attraction that a centralized database would present to hackers.

Companies undoubtedly will want to establish a key-escrow system for essential corporate data, but they most assuredly won't want to leave the keys in some government-accessible repository. And companies certainly won't want software and hardware vendors to be forced to build their systems with trap doors — by definition, an invitation to attack. Yet that's where Congress is taking us, under the lobbying thumb of law enforcement.

It's only fair to acknowledge that the government's fears are grounded in reality. Criminals are indeed using encryption today, and will use it tomorrow, to keep others from reading their messages.

But we accept some degree of risk in return for the right to speak, assemble, do business and otherwise live in a free society. Our Constitution explicitly risks allowing some criminals to go free so that innocent people won't be punished for crimes they didn't commit.

If the Constitution isn't worth your trouble, at least consider your business. The encryption laws proposed by the government will make your enterprise's information much less secure. Is that a risk your enterprise can afford? □

Gillmor is computing editor at the San Jose Mercury News. *His Internet address is dgillmor@sjmercury.com.*

Staying focused on extranets

David Moschella

There are few better examples of the speed of "Web years" than the rapid shift in focus from the Internet (1995) to intranets (1996) and now extranets. What's next?

But just because the buzzwords are flying fast doesn't mean customers are *doing* anything. To find out what's really happening, I recently chaired a vendor panel on "Extranets: the Bridge to Electronic Commerce." Here's what I learned.

It would appear that 20% to 30% of Fortune 1,000-class companies have some sort of extranet project under way. By extranet, I mean the use of Internet technologies to let designated outsiders access information on your company's intranet.

Of course, some of these applications are pilots, and some allow access only to nonsensitive information. Yet a small but growing number are mission-critical.

Given how new intranets and extranets are, 20% to 30% sounds pretty impressive. But some extranets are indistinguishable from what used to be called electronic data interchange (EDI) systems. Many of these systems have been around for years. Indeed, in the early 1980s, one of my first jobs in this business was studying the use of EDI. After several years of disappointment, I reached one main conclusion: The widespread use of EDI would always be just around the corner. Barriers include system incompatibilities, inflexibilities, security, trust and management.

Because the Web can deal with unstructured information much better than EDI, and because today's Internet technologies are much more interoperable than older proprietary systems, real progress has been made on the compatibility and flexibility front.

But problems with security, trust and management remain intact and interrelated. Extranet projects are usually driven by a business unit that can see the value of real-time information exchange with selected outside parties. It's generally up to IS to make the system work. That's relatively straightforward when businesses are trying to reach individual customers.

But in most cases, extranets involve at least two organizationso. Sometimes, several Internet service providers and service companies are also involved. Issues of trust, security, control and accountability aren't easily resolved.

These management issues seem to greatly outweigh product concerns. Panelist discussions on whether Internet technologies were up to the job seemed to hinge on three conceptual cul de sacs, each tinged with irony:

- Extranets are based on Internet technologies, so don't they have all the same security and reliability problems?
- How can businesses credibly say to consumers that the Internet is secure when they use private extranets for their own work?
- If advanced applications migrate off the public Internet to more capable private systems, doesn't that reduce the pressure to improve the 'net?

These long-term dilemmas remained largely unanswered.

But rather than wait for perfection, the faithful are pressing on. Serious extranet investments will continue because in the end, extranets are much more important than intranets. The former focus on doing business; the latter seek often elusive internal efficiencies. Indeed, unless the goal is to use intranets as steppingstones to extranets and real electronic commerce, many companies would be better off sticking with existing client/server systems.

But like EDI before it, true electronic commerce is more difficult than the internal automation IS has grown comfortable with. The challenge for IS is to resist taking the easy path. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. *His Internet address is david_moschella@cw.com.*

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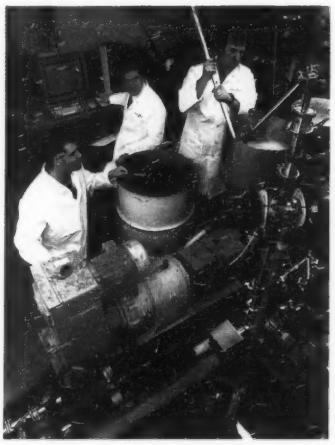
Dispatches & images from the fringes of the electronic frontier

SENSORS IN THE SOUP

Scientists at Purdue University in West Lafayette, Ind., run a computer-integrated food processing laboratory to demonstrate how new sensors and automation can improve the quality of everything from tortilla chips to tomato soup. The production-line sensors monitor factors such as moisture, sugar content or soup viscosity to eliminate bad batches and improve consistency of the final product.



Year 2000: *A pair of haiku*

Weary programmers
The end of the world is near
Rewrite the past's wrongs

Fearful managers
go to sleep and dream until
2001

– Julie Sklut, IT staffer at Pinkerton's, Inc., Encino, Calif.

Laptop Solutions in Houston has an antiglare film to make LCD screens easier to see outdoors

News to ponder

Sept. 16 marked the first anniversary of what may be the only radio talk show devoted exclusively to the year 2000 computer problem. *The Y2K Investor*, which airs three times per week in the Washington metropolitan area, has featured interviews with lawmakers, heads of federal agencies, consultants and many CIOs.

Now you can get your Big Gulp, your Slurpee and your E-mail at the same 7-Eleven convenience store. Southland has installed Internet access kiosks — with ISDN lines, no less — at eight Seattle-area stores. Customers activate the terminals with the swipe of a credit card. The cost is 35 cents per minute.

Abbott Systems has developed an "Internet customer service chat robot" called Robbie. Customers can send a question to Robbie (*www.abbottsys.com/atchat.html*), which responds in a fast yet friendly manner using its "knowledge base" of answers to frequently asked questions. Robbie costs $499.

Inside Lines

Zen and the art of NC demos

Much to his dismay, Oracle CEO Larry Ellison demonstrated one of the downsides of network computers during yet another thin-clients-are-good speech at Oracle OpenWorld '97 in Los Angeles last week. The network crashed mid-demo. He decided to move on and "just show you our wonderful [database] technology, something that I know for sure works." Not so fast, Larry — that demo also died an untimely death. "I don't believe this," Ellison said. The network eventually was restored and Ellison finished part of the demo, but he admitted to reporters afterward that the whole thing was "a fiasco."

Joysticks to the world

Forget the Active Directory. The real hit of Microsoft's Professional Developers Conference last week was the news that the Windows NT 5.0 beta would include a whole new set of 32-bit multimedia and 3-D games that use force-feedback joysticks for quicker, more accurate user response. Developers in attendance greeted that news with whistles and howls. Not long after the session ended, attendees were seen rushing to the nearest PC to start playing.

Lotus hedges bets on the NC

Sources close to Lotus said the company has shifted gears on the target platform for Kona, its line of Java applets. Originally, the applets were supposed to run on network computers only, but the company now is building them to run on PCs.

Digital Unix isn't an oxymoron

OK, so Windows NT may be the new religion in Maynard, Mass., these days. But that doesn't mean Digital doesn't care about other operating systems. How do we know? Because Digital is getting ready to announce a new version of its 64-bit Digital Unix (remember it?) in early October. The highly Web-ified operating system will come packed with features that increase scalability and performance and a new version of its TruCluster high-reliability software, a source said.

Don't invest in copper futures just yet

The copper industry let out a big yawn when IBM announced plans last week to build new semiconductors with copper instead of aluminum to cut costs and speed calculations. The tiny chips would use only about 17,000 pounds of the metal in one year, according to the Copper Development Association — or 0.0002236% growth for the industry.

Getting off their rockers

To help fill the skills gap of programmers needed to fix the year 2000 problem, Fujitsu Software is donating software and instructors to Senior Staff2000, a San Jose, Calif., data bank of retired Cobol programmers being tapped to help organizations fix the millennium bug. According to Stamford, Conn.-based Gartner Group, 600,000 programmers are needed to fix date-sensitive code, but only 200,000 are available in the current workforce. There are currently 5,000 names in the Senior Staff2000 database.

Switch pricing plummets

Cisco Systems, Inc. today will announce price cuts of up to 50% on Ethernet switches it sells to small and midsize businesses. The new prices are effective immediately. Price cuts industrywide on Ethernet switches have prompted users to deploy the LAN switching technology faster or more broadly.

It seems cyberspace has a bit of competition. According to 'netizens of the world, that realm just in front of cyberspace where fingers touch keyboards is referred to as "meatspace." We prefer the term reality, but look for meatspace to turn up in your 6-year-old's vocabulary any day now. If you've heard any unusual terms or if you have a news tip, contact news editor Patricia Keefe at (508) 820-8183 or E-mail her at patricia_keefe @cw.com.

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Dispatches & images from the fringes of the electronic frontier

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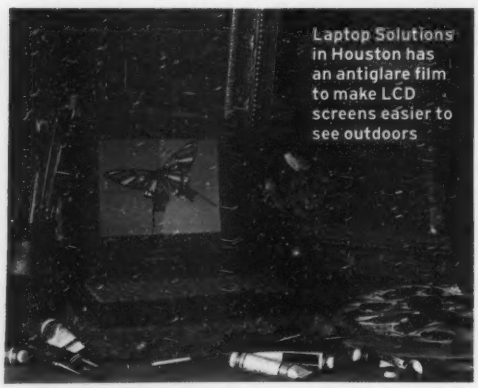

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News to ponder

Sept. 16 marked the first anniversary of what may be the only radio talk show devoted exclusively to the year 2000 computer problem. *The Y2K Investor*, which airs three times per week in the Washington metropolitan area, has featured interviews with lawmakers, heads of federal agencies, consultants and many CIOs.

Now you can get your Big Gulp, your Slurpee and your E-mail at the same 7-Eleven convenience store. Southland has installed Internet access kiosks — with ISDN lines, no less — at eight Seattle-area stores. Customers activate the terminals with the swipe of a credit card. The cost is 35 cents per minute.

Abbott Systems has developed an "Internet customer service chat robot" called Robbie. Customers can send a question to Robbie *(www.abbottsys.com/atchat.html)*, which responds in a fast yet friendly manner using its "knowledge base" of answers to frequently asked questions. Robbie costs $499.

Inside Lines

Zen and the art of NC demos

Much to his dismay, Oracle CEO Larry Ellison demonstrated one of the downsides of network computers during yet another thin-clients-are-good speech at Oracle OpenWorld '97 in Los Angeles last week. The network crashed mid-demo. He decided to move on and "just show you our wonderful [database] technology, something that I know for sure works." Not so fast, Larry — that demo also died an untimely death. "I don't believe this," Ellison said. The network eventually was restored and Ellison finished part of the demo, but he admitted to reporters afterward that the whole thing was "a fiasco."

Joysticks to the world

Forget the Active Directory. The real hit of Microsoft's Professional Developers Conference last week was the news that the Windows NT 5.0 beta would include a whole new set of 32-bit multimedia and 3-D games that use force-feedback joysticks for quicker, more accurate user response. Developers in attendance greeted that news with whistles and howls. Not long after the session ended, attendees were seen rushing to the nearest PC to start playing.

Lotus hedges bets on the NC

Sources close to Lotus said the company has shifted gears on the target platform for Kona, its line of Java applets. Originally, the applets were supposed to run on network computers only, but the company now is building them to run on PCs.

Digital Unix isn't an oxymoron

OK, so Windows NT may be the new religion in Maynard, Mass., these days. But that doesn't mean Digital doesn't care about other operating systems. How do we know? Because Digital is getting ready to announce a new version of its 64-bit Digital Unix (remember it?) in early October. The highly Web-ified operating system will come packed with features that increase scalability and performance and a new version of its TruCluster high-reliability software, a source said.

Don't invest in copper futures just yet

The copper industry let out a big yawn when IBM announced plans last week to build new semiconductors with copper instead of aluminum to cut costs and speed calculations. The tiny chips would use only about 17,000 pounds of the metal in one year, according to the Copper Development Association — or 0.0002236% growth for the industry.

Getting off their rockers

To help fill the skills gap of programmers needed to fix the year 2000 problem, Fujitsu Software is donating software and instructors to Senior Staff 2000, a San Jose, Calif., data bank of retired Cobol programmers being tapped to help organizations fix the millennium bug. According to Stamford, Conn.-based Gartner Group, 600,000 programmers are needed to fix date-sensitive code, but only 200,000 are available in the current workforce. There are currently 5,000 names in the Senior Staff 2000 database.

Switch pricing plummets

Cisco Systems, Inc. today will announce price cuts of up to 50% on Ethernet switches it sells to small and midsize businesses. The new prices are effective immediately. Price cuts industrywide on Ethernet switches have prompted users to deploy the LAN switching technology faster or more broadly.

It seems cyberspace has a bit of competition. According to 'netizens of the world, that realm just in front of cyberspace where fingers touch keyboards is referred to as "meatspace." We prefer the term reality, but look for meatspace to turn up in your 6-year-old's vocabulary any day now. If you've heard any unusual terms or if you have a news tip, contact news editor Patricia Keefe at (508) 820-8183 or E-mail her at patricia_keefe @cw.com.

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Corel + Java™

Enterprise Solutions For Today and Tomorrow

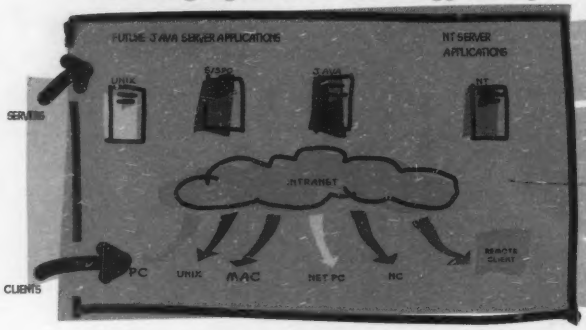
"Our commitment to Java and open standards is stronger than ever. Building on the revolutionary Corel Office for Java project, our new Java products offer a clear vision of tomorrow while providing a compatibility bridge for today's software and hardware solutions. Combined with Corel's award-winning productivity applications, Java is a compelling enterprise technology. The future starts now."

Dr. Michael Cowpland, August 22, 1997

Decision makers have struggled with two major issues in deploying technology. First, the productivity gains of computer technology, as applied to business, have often been offset by the total cost of ownership issues including purchase, deployment and maintenance. Second, businesses have struggled with non-compatible hardware and software solutions within their enterprises. Corel's Java™ initiatives will appeal to decision makers looking to resolve these strategic issues.

The power of Java's multi-platform capability, open standards and modern modular architecture is transforming enterprise computing. Corel utilizes Java to extend the life of the huge installed base of Windows® based legacy software. Corel's new Java-enabled software provides two innovative solutions:

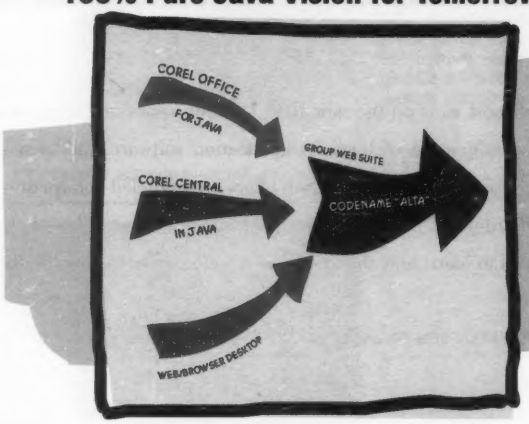
Leveraging Java Technology Today



Java Bridge to Windows NT® Server (code named "Remagen")

This new 100% pure Java-based thin client software allows organizations to give all users, regardless of their desktop platforms (Windows 95, Windows 3.x, Macintosh®, OS/2, UNIX, etc.), full access to the latest Windows 95 productivity software running on a central server. This will provide huge savings in hardware upgrades, training costs and software maintenance because applications are maintained in a central location. Corporations can extend the life of the Windows 3.x platform since they can keep their existing hardware while using the latest and greatest productivity applications.

100% Pure Java Vision for Tomorrow



A Revolutionary Web-Centric Java Product (code named "Alta")

"Alta" is the evolution of ideas from the existing CorelCENTRAL™ product, technology from the Corel® Office for Java product, and new innovations emerging in today's marketplace. "Alta" will provide an improved platform for information management and knowledge handling inside and outside the organization. "Alta" will leverage a corporate intranet by using a Java-based set of "clean desk" modular applets. It will allow users to define the work tasks they do most frequently while "pushing down" the unused features and functions that clutter their work space, resulting in improved productivity. "Alta" is intended to be used with existing office productivity applications from any vendor.

Corel: Corporate Compatible

Corel Corporation is recognized internationally as an award-winning developer and marketer of productivity applications. Corel's existing WordPerfect® family of products deliver office suite excellence with a commitment to multi-platform support and compatibility. Corel's Enterprise Java Solutions are the evolution of Corel's commitment to meeting enterprise needs today and tomorrow. "Remagen" based solutions will be available starting in October 1997 and the "Alta" product is scheduled to be available Spring 1998.

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For more information about Corel's Enterprise Java Solutions, visit www.corel.com

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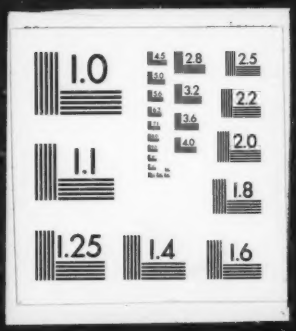
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